85. Respondents may dispute EPA's right to the stated amount of penalties by invoking the dispute resolution procedures under Section XX (Dispute Resolution). Penalties will accrue but need not be paid during the dispute resolution period. If Respondents do not prevail upon resolution, all penalties are due to EPA within 30 days of resolution of the dispute and the provisions of paragraph 80 apply to unpaid balances. If Respondents prevail upon resolution, the penalties at issue in the dispute resolution need not be paid.

86. Notwithstanding any other part of this Order, with respect to any submission that is disapproved by EPA under "(c)" or "(d)" of paragraph 43, if EPA notifies Respondents in writing that EPA has decided that Respondents need not make any correction to the disapproved submission and that corrections may be made in a subsequent related submission, any stipulated penalties will cease to accrue on the date of EPA's decision as indicated in the written notice.

87. The stipulated penalty provisions of this Order do not preclude EPA from pursuing any other remedies or sanctions available to EPA due to Respondents' failure to comply with this Order, including without limitation the completion of all or part of the RI/FS by EPA. Payment of stipulated penalties does not alter Respondents' obligation to complete the requirements of this Order.

XXII. FORCE MAJEURE

88. "Force majeure," for purposes of this Order, is defined as any event arising from causes beyond the control of the Respondents, of any entity controlled by Respondents, or of Respondents' contractors, that delays or prevents the performance of any requirement of this Order despite Respondents' best efforts to fulfill the requirement. The requirement that the Respondents exercise "best efforts to fulfill the requirement" includes using best efforts to anticipate any potential force majeure event and best efforts to address the effects of any potential force majeure event (1) as it is occurring and (2) following the potential force majeure event, such that the delay is minimized to the greatest extent possible. "Force Majeure" does not include financial inability to complete the work or a failure to attain the Performance Standards.

89. If any event occurs or has occurred that may delay Respondents' performance of any requirement of this Order, whether or not caused by a force majeure event, the Respondents shall notify orally a RPM or, in the absence of both RPMs, the Director of the Superfund Division, EPA Region 6 [Address: Superfund Division Director ((6SF), U.S. Environmental Protection Agency Region 6, 1445 Ross Avenue, Dallas, TX 75202-2733] within five days of when Respondents first knew that the event might cause a delay. Within ten days thereafter, Respondents shall provide in writing to EPA an explanation and description of: the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Respondents' rationale for attributing such delay to a force majeure event if they intend to assert such a claim; and a statement as to whether, in

the opinion of the Respondents, such event may cause or contribute to an endangerment to public health, welfare or the environment. The Respondents shall include with any notice all available documentation supporting their claim that the delay was attributable to a force majeure. Failure to comply with the above requirements shall preclude Respondents from asserting any claim of force majeure for that event for the period of time of such failure to meet a requirement of the Order, and for any additional delay caused by such failure. Respondents shall be deemed to know of any circumstance of which Respondents, any entity controlled by Respondents, or Respondent's contractors knew or should have known.

90. If EPA, agrees that the delay or anticipated delay in Respondents' performance of a requirement is attributable to a force majeure event, the time for performance of the requirements under this Order that are affected by the force majeure event will be extended by EPA, for such time as is necessary to complete those requirements. An extension of the time for performance of the requirements affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify the Respondents in writing of its decision. If EPA agrees that the delay is attributable to a force majeure event, EPA will notify the Respondents in writing of the length of the extension, if any, for performance of the requirements affected by the force majeure event.

91. If the Respondents elect to invoke the dispute resolution procedures set forth in Section XX (Dispute Resolution), they shall do so no later than 14 days after receipt of EPA's notice. In any Dispute Resolution proceeding, Respondents shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Respondents complied with the requirements of Paragraphs 88 and 89, above. If Respondents carry this burden, the delay at issue shall be deemed not to be a violation by Respondents of the affected requirement of this Order identified to EPA.

XXIII. SPECIAL ACCOUNT FOR RESPONSE COSTS

92. In accordance with Section 122(b)(3) of CERCLA, 42 U.S.C.§ 9622(b)(3), Respondents shall provide funds to EPA, according to the procedures and time frames described in this Section, for the payment of Response Costs except for Past Response Costs. Respondents shall also pay Interest on any late payment. EPA will establish a reimbursable special account (the "Tar Creek OU4 Special Account for RI/FS") to retain those funds. Except as otherwise provided herein, EPA will use the special account solely for the payment of Response Costs except for Past Response Costs. EPA will provide Respondents with monthly Superfund Cost Organization Recovery Package Imaging Online System (SCORPIOS) reports (or their future equivalent) regarding expenses paid up to the date of the report. If, after reviewing a monthly

SCORPIOS report, Respondents need more detailed information about a cost summarized, Respondents may notify in writing the RPM to inquire about the specific details. The RPM will attempt to provide the requested information within 14 days of the notification.

93. EPA has estimated that the amount of Response Costs that will be expended by EPA at OU4 (after the effective date) during the RI/FS on an annual basis will be $380,000. EPA has also estimated that the Work, as defined herein, should be completed within a two-year period. It is anticipated that should the work be spread over a longer period of time, that EPA's Response Costs would also be spread over the same period of time. For example, if the Work takes three years, rather than two, it is anticipated that EPA will expend $760,000 in Response Costs over that three-year period. Within 30 days of the effective date of this Order, Respondents shall pay $50,000 to be deposited in the Tar Creek OU4 Special Account for RI/FS by Electronic Funds Transfer ("EFT"), in accordance with EFT instructions provided by EPA, or by submitting a certified or cashier's check made payable to "EPA Hazardous Substance Superfund" to:

EPA Superfund - Tar Creek Superfund Site (06JW)
CERCLIS #: OKD980629844
Superfund Accounting
P.O. Box 360582M
Pittsburgh, Pennsylvania 15251
ATTN: COLLECTION OFFICER FOR SUPERFUND

Respondents shall reference the "Tar Creek Superfund Site OU4 (06JW), CERCLIS #: OKD980629844," the name and address of the Respondents, the words "EPA Docket Number CERCLA 6-03-01 Tar Creek OU4 Special Account for RI/FS" on each check. Respondents shall forward a copy of the check and any transmittal letter to the RPMs and to:

Chief, Superfund Cost Recovery Section (6SF-AC)
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Within 120 days of the effective date of this Order, Respondents shall pay an additional $330,000 to be deposited in the Tar Creek OU4 Special Account for RI/FS by Electronic Funds Transfer ("EFT"), in accordance with EFT instructions provided by EPA, or by submitting a certified or cashier's check made payable to "EPA Hazardous Substance Superfund" at the address provided above in this paragraph. Respondents shall reference the "Tar Creek Superfund Site OU4 (06JW), CERCLIS #: OKD980629844," the name and address of the Respondents, the words "EPA Docket Number CERCLA 6-03-01 Tar Creek OU4 Special Account for RI/FS" on each check. Respondents shall forward a copy of the check and any transmittal letter to the RPMs and to the Chief, Superfund Cost Recovery Section (6SF-AC) at the address provided above in

this paragraph.

94. Any time after 12 months of the effective date of the Order, if the Tar Creek OU4 Special Account for RI/FS is drawn down by EPA to a balance of approximately $50,000, EPA will send a notice to Respondents and, if warranted, will provide an adjusted estimate of Response Costs to be expended in the next 12 months by EPA. In addition, EPA will submit to Respondents an accounting summary of Response Costs paid (debited) from the Tar Creek OU4 Special Account for RI/FS since the effective date. The Response Costs accounting summary shall be in the form of an unreconciled SCORPIOS (or its future equivalent). In addition, EPA will submit to Respondents sufficient backup information to demonstrate who did the work and that the work is related to OU4, including such information for any Response Costs incurred by ODEQ and/or the Quapaw Tribe, as well as copies of any relevant memoranda of agreement pursuant to which costs have been paid to Oklahoma or the Quapaw Tribe. At a minimum, invoices, direct expense vouchers, time sheets, and a narrative of tasks performed will be included with the documentation. If Respondents need more detailed information about a specific cost summarized on the SCORPIOS Report, Respondents may notify in writing the RPMs to inquire about the specific details. The RPMs will, within 14 days of such notice, attempt to provide the requested information. After the expiration of this 14-day period, Respondents may request that EPA prepare and certify a Response Cost accounting of some or all Response Costs paid since the effective date. The EPA's cost of preparing the certified Response Cost accounting is a Response Cost payable from the Tar Creek OU4 Special Account for RI/FS.

95. Respondents shall, within 30 days of receipt of a notice and Response Cost accounting summary (*i.e.*, the SCORPIOS report or its future equivalent) in accordance with the procedure described in the preceding paragraph, remit to the Tar Creek OU4 Special Account for RI/FS the amount EPA identifies as necessary to replenish the Tar Creek OU4 Special Account for RI/FS to a balance of $380,000 or to replenish the account to a balance of EPA's adjusted estimate of Response Costs to be expended within the next 12 months (whichever amount is less). Respondents shall make such payments according to the procedures described in paragraph 93 including without limitation the procedures for providing notice of remittance. Neither dispute resolution nor a request to the RPMs for more detailed information nor a request for a certified cost accounting shall delay the date that Respondents' payments are due under this paragraph.

96. If, while EPA is waiting for the payment required by Paragraph 95, the Tar Creek OU4 Special Account for RI/FS is depleted to an amount of $15,000 or less at the time EPA submits a notification and cost accounting summary to Respondents as provided in paragraph 94, Respondents shall pay, within ten days of EPA's notice, $50,000 to the Tar Creek OU4 Special Account for RI/FS in accordance with the procedure described in Paragraph 93 including without limitation the procedure for providing notice of the remittance. Respondents shall remit the remaining amount (in addition to the $50,000) to replenish the Tar Creek OU4 Special Account for RI/FS to $380,000 or to the amount of EPA's adjusted estimate of the next 12 months of Response Costs (whichever amount is less) in accordance with the procedures and time frames

described in Paragraphs 94 and 95.

97. EPA will remit and return to Respondents the difference between any balance that remains on the date of termination of this Order in the Tar Creek OU4 Special Account for RI/FS and the most recent 12-month estimate of Response Costs provided by EPA under paragraph 94. That is, if the balance on the date of termination is greater than the last 12-month Response Costs estimate, EPA will remit the difference between the balance and the estimate to the Respondents. Termination and satisfaction of the terms of this Order will be in accordance with Section XXIX (Termination and Satisfaction). EPA's obligation to return funds to Respondents from the Tar Creek OU4 Special Account for RI/FS shall terminate upon EPA's assumption of performance of any portion of the work pursuant to Paragraphs 38, 55, 65, or 77.

98. Respondents may invoke the Dispute Resolution provisions of Section XX (Dispute Resolution) of this Order regarding the amount that EPA debits from the Tar Creek OU4 Special Account for RI/FS as described in the certified cost packages that EPA provides to Respondents along with the notification described in paragraph 94. Respondents may dispute Response Costs 1) based upon accounting errors, 2) because the costs were not related to OU4, 3) because the costs were for work that was not consistent with the NCP, 4) because the costs are not Response Costs as defined by this Order, or (5) because costs are not consistent with EPA's estimate in paragraph 93. Notwithstanding any other provision of this Order, in any dispute resolution concerning Response Costs, Respondents bear the burden of establishing 1, 2, 3, 4 or 5 in this paragraph. If Respondents prevail in dispute resolution regarding Response Costs, EPA will adjust the Tar Creek OU4 Special Account for RI/FS to reflect the amount determined in the resolution of the dispute.

XXIV. RESERVATIONS OF RIGHTS AND REIMBURSEMENT OF OTHER COSTS

99. EPA reserves the right to perform its own studies and to terminate this Order, or take over, undertake, or redo work required hereunder, to seek reimbursement for the costs of such actions from Respondents and Federal Respondents (or others), and to seek any other appropriate relief including but not limited to, taking civil or administrative actions for performance of Respondents' and/or Federal Respondents obligations under this Order.

100. EPA reserves the right to bring an action against Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of costs related to other operable units of the Site, for recovery of all Response Costs (including without limitation Past Response Costs) incurred by the United States at the Site (including without limitation OU4) that are not reimbursed by Respondents, for recovery of any costs incurred in the event EPA performs the RI/FS or any part of it, and for recovery of any future costs incurred by the United States in connection with response activities conducted at the Site including without limitation OU4. This Order is without prejudice to any of EPA's rights to recover from Respondents and Federal Respondent costs related to other operable units of the Site, Response Costs (including without limitation Past

Response Costs) incurred by the United States at the Site (including without limitation OU4) that are not reimbursed by Respondent and Federal Respondent, costs incurred in the event EPA performs the RI/FS or any part of it, and any future costs incurred by the United States in connection with response activities conducted at the Site including without limitation OU4, and EPA reserves its right to recover such costs from Respondents and Federal Respondent under applicable laws including without limitation CERCLA Section 107, 42 U.S.C. § 9607.

101. EPA reserves the right to bring an action against Respondents to enforce the response cost reimbursement requirements of this Order, to collect stipulated penalties assessed pursuant to Section XXI (Delay in Performance/Stipulated Penalties), and to seek penalties pursuant to Section 109 of CERCLA, 42 U.S.C. § 9609. Notwithstanding any other provision of this Order, the United States reserves, and this Order is without prejudice to, any and all claims that it may have with respect to liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments

102. Except as expressly provided in this Order, each party to this Order reserves all rights and defenses it may have. Nothing in this Order affects EPA's removal or remedial authority or EPA's response or enforcement authorities, including the right to seek injunctive relief, stipulated penalties, statutory penalties, and/or punitive damages. However, in conjunction with the execution of this Order, EPA has provided Respondents a letter concerning its position regarding liability of Respondents for OU2.

103. After satisfying the requirements of this Order, Respondents and Federal Respondent will have resolved their liability to EPA for the work performed by Respondents pursuant to this Order. Respondents and Federal Respondent are not released from liability, if any, for any EPA response actions (and the associated costs) taken beyond the scope of this Order regarding removals, CERCLA response actions at other operable units of the Site, remedial design, remedial action, or operation and maintenance for OU4, or activities arising pursuant to Section 121(c) of CERCLA, 42 U.S.C. § 9621(c).

104. The EPA agrees that the Respondents and Federal Respondent are entitled, as of the effective date of this Order, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Order. The "matters addressed" in this Order are the Work including without limitation the RI/FS for OU4, and payments that the Respondent and Federal Respondent make to EPA for Response Costs. The "matters addressed" in this Order do not include Past Response Costs as defined herein, nor do they include costs or response actions as to which the United States including without limitation EPA has reserved its rights under this Order (except for claims for failure to comply with this Order), in the event that the United States asserts rights against Respondents or Federal Respondent coming within the scope of such reservations.

XXV. DISCLAIMER

105. By signing this Order and taking actions under this Order, Respondents and Federal Respondent do not necessarily agree with EPA's Findings of Fact or Conclusions of Law. Furthermore, the participation of Respondents and Federal Respondent in this Order may not be considered an admission of liability and is not admissible in evidence against Respondents or Federal Respondent in any judicial or administrative proceeding, other than a proceeding by the United States, including EPA, to enforce this Order or a judgment relating to it. Respondents and Federal Respondents retain their rights to assert claims against other potentially responsible parties at the Site including without limitation OU4. However, the Respondents agree not to contest the validity or terms of this Order, or the procedures underlying or relating to it, in any action brought by the United States, including without limitation EPA, to enforce its terms.

XXVI. OTHER CLAIMS

106. In entering into this Order, Respondents waive any right to seek reimbursement under Section 106(b) of CERCLA, 42 U.S.C. § 9606(b) for Respondents' costs related to this Order. Respondents also waive any right to present a claim under Section 111 or 112 of CERCLA, 42 U.S.C. §§ 9611 and 9612 for Respondents' costs related to this Order. This Order does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA. Respondents further waive all other statutory and common law claims against EPA, including contribution and counterclaims, relating to or arising out of conduct of the RI/FS.

107. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, subsidiary or corporation not a signatory to this Order for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, pollutants, or contaminants found at, taken to, or taken from the Site including without limitation OU4.

108. Respondents shall bear their own costs and attorneys fees.

XXVII. FINANCIAL ASSURANCE, INSURANCE, AND INDEMNIFICATION

109. Respondents shall establish and maintain financial security in the amount of $1,000,000 in one or more of the following forms:

a. A surety bond guaranteeing performance of the Work;

b. One or more irrevocable letters of credit equaling the total estimated cost of the Work;

c. A trust fund;

d. A guarantee to perform the Work by one or more parent corporations or

subsidiaries, or by one or more unrelated corporations that have a substantial business relationship with at least one of the Respondents; or

e. A demonstration that one or more of the Respondents satisfy the requirements of 40 C.F.R. Part 264.143(f) (NOTE: For these purposes, references in 40 CFR 264.143 (f) to the "sum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimates" shall mean the amount of financial security specified above. If the Respondent who seeks to provide a demonstration under 40 CFR 264.143(f) has provided a similar demonstration at other RCRA or CERCLA sites, the amount for which it was providing financial assurance at those other sites should generally be added to the estimated costs of the Work from this paragraph.) Beginning on January 1, 2005, and on or before the fifteenth calendar day of each calendar year quarter thereafter, Respondents shall fund the financial security sufficiently to perform the remaining work and other activities required under this Order projected for the succeeding calendar year quarter (taking into account the financial obligations of the Federal Respondent). During the course of the Work, if the projected amount of the cost of the remaining work is less than the amount remaining in the financial mechanism, Respondents shall be entitled to reduce the amount of the financial mechanism.

110. If at any time the net worth of the financial security provided by Respondents is insufficient to perform the work and other requirements under the Order for the upcoming quarter (taking into account the financial obligations of the Federal Respondent), Respondents must provide written notice to EPA within seven days after the net worth of the financial instrument or trust account becomes insufficient. The written notice shall describe why the financial instrument or trust account is funded insufficiently and explain what actions have been or will be taken to fund the financial instrument or trust account adequately.

111. (a) Before commencement of any work under this Order, Respondents shall secure, and must maintain in force for the duration of this Order, and for two years after the completion of all requirements of this Order, Comprehensive General Liability ("CGL") with a $1,000,000 per occurrence and $2,000,000 aggregate limit and automobile insurance, with limits of $1,000,000, combined single limit, naming as insured the United States. The CGL insurance must include Contractual Liability Insurance in the amount of $1,000,000 per occurrence, and Umbrella Liability Insurance in the amount of $4,000,000 aggregate limit.

(b) For the duration of this Order, Respondents shall satisfy, or shall ensure that their contractors and subcontractors satisfy, all applicable laws and regulations regarding the provision of employer's liability insurance and workmen's compensation insurance for all persons performing work on behalf of Respondents, in furtherance of this Order.

(c) If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that

described above, or insurance covering the same risks but in a lesser amount, then with respect to that contractor or subcontractor Respondents need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor.

(d) Before commencement of any work under this Order, and annually thereafter on the anniversary of the effective date of this Order, Respondents shall provide to EPA certificates of such insurance and a copy of each insurance policy.

112. Respondents agree to indemnify and hold the United States Government, its agencies, departments, agents, and employees harmless from any and all claims or causes of action arising from or on account of acts or omissions of Respondents, their employees, agents, servants, receivers, successors, or assignees, or any persons including, but not limited to, firms, corporations, subsidiaries and contractors, in carrying out activities under this Order. The United States Government or any agency or authorized representative thereof may not be held as a party to any contract entered into by Respondents in carrying out activities under this Order.

XXVIII. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

113. The effective date of this Order will be the date it is signed by EPA and Respondents and Federal Respondent.

114. This Order may be amended by mutual agreement of EPA and Respondents and Federal Respondent. Amendments must be in writing and will be effective when signed by EPA, Respondents, and Federal Respondent. EPA will consult with the Quapaw Tribe and with the ODEQ prior to any amendment of the Order. The RPMs do not have the authority to sign amendments to the Order.

115. No informal advice, guidance, suggestions, or comments by EPA regarding submissions or other deliverables submitted by Respondents will be construed as relieving the Respondents of their obligation to obtain such formal approval as may be required by this Order including without limitation approvals required in EPA-approved submissions and the SOW. Any submissions including without limitation plans, technical memoranda, reports (other than progress reports), specifications, schedules and attachments required by this Order are automatically incorporated into this Order upon approval by EPA.

XXIX. TERMINATION AND SATISFACTION

116. This Order (except for Sections XIX (Retention of Records) and XXIV (Reservation of Rights and Reimbursement of Other Costs)) shall terminate when Respondents

and Federal Respondent each demonstrate in writing and certify to the satisfaction of EPA that all requirements of this Order to be met by that certifying party have been met and EPA has approved the certification. For Respondent, the written certification shall include, without limitation, a statement that any additional work, payment of Response Costs (except for Past Response Costs), and payment of any stipulated penalties demanded by EPA, have been performed. For Federal Respondent, the written certification shall state that Federal Respondent has fulfilled its payment obligations under the funding agreement that is Section X (Reimbursement of Respondents by the Federal Respondent). The certification must be signed by responsible officials representing each Respondent and Federal Respondent, respectively. Respondents' representative must make the following attestation: "I certify that the information contained in or accompanying this certification, except for any information included over the specific written objection of Respondents, is true, accurate, and complete, based upon information provided by contractors and/or consultants with relevant knowledge of the facts." Federal Respondent's representative must make the following attestation: "I certify that the information contained in or accompanying this certification is true, accurate, and complete based upon information provided by government employees with the relevant knowledge of the facts." For purposes of this paragraph, with respect to the Respondents, a responsible official is a corporate official who is in charge of a principal business function, and, with respect to Federal Respondent, a responsible official is a Regional Division Director, or equivalent.

117. EPA will approve the Respondents' and Federal Respondent's certification and terminate this Order when it is satisfied that Respondents and Federal Respondent have performed all the requirements of the Order. Termination of this Order in accordance with this paragraph will not terminate Respondents' and Federal Respondent's obligation to comply with Sections XIX (Retention of Records), and XXIV (Reservation of Rights and Reimbursement of Other Costs) of this Order.

BY: _____ DATE: Dec 9, 2003

Richard E. Greene
Regional Administrator
U.S. Environmental Protection Agency
Region 6

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6

IN THE MATTER OF:	)	CERCLA DOCKET NO. 6-03-01
	)	
Tar Creek Superfund Site	)	ADMINISTRATIVE ORDER
Ottawa County, Oklahoma	)	ON CONSENT FOR RI/FS FOR OU4
	)	
	)	Proceeding under Sections 104, 122(a), and
	)	122(d)(3) of the Comprehensive
Blue Tee Corp.,	)	Environmental Response, Compensation
Gold Fields Mining Corporation, and	)	
the U.S. Department of the Interior	)	and Liability Act, 42 U.S.C. §§ 9604, U.S.
	)	9622(a), and 9622(d)(3)
	)	
Respondents	)	
	)	

THE UNDERSIGNED SETTLING PARTY enters into this Agreement in the matter of Tar Creek Superfund Site, CERCLA Docket Number 6-03-01, relating to the Remedial Investigation and Feasibility Study for Operable Unit 4 at the Tar Creek Superfund Site, Ottawa County, Oklahoma:

FOR SETTLING PARTY: BLUE TEE CORP.

c/o 1 North Maple Ave, Greensburg, PA 15601
Address

By: Terrance Gileo Faye 11/7/03
Signature Date

Terrance Gileo Faye, Special Counsel
Print name and title of Signatory

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6

IN THE MATTER OF:	)	CERCLA DOCKET NO. 6-03-01
	)	
Tar Creek Superfund Site	)	ADMINISTRATIVE ORDER
Ottawa County, Oklahoma	)	ON CONSENT FOR RI/FS FOR OU4
	)	
	)	Proceeding under Sections 104, 122(a), and
	)	122(d)(3) of the Comprehensive
Blue Tee Corp., and	)	Environmental Response, Compensation
Gold Fields Mining Corporation, and	)	
the U.S. Department of the Interior	)	and Liability Act, 42 U.S.C. §§ 9604, U.S.
	)	9622(a), and 9622(d)(3)
	)	
Respondents	)	
	)	

THE UNDERSIGNED SETTLING PARTY enters into this Agreement in the matter of Tar Creek Superfund Site, CERCLA Docket Number 6-03-01, relating to the Remedial Investigation and Feasibility Study for Operable Unit 4 at the Tar Creek Superfund Site, Ottawa County, Oklahoma:

FOR SETTLING PARTY: GOLD FIELDS MINING CORPORATION

c/o 1 North Maple Ave., Greensburg, PA 15601
Address

By: Terrance Gileo Faye 11/7/03
Signature Date

Terrance Gileo Faye, Agent
Print name and title of Signatory

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6

IN THE MATTER OF:	)	CERCLA DOCKET NO. 6-03-01
	)	
Tar Creek Superfund Site Ottawa County, Oklahoma	)	ADMINISTRATIVE ORDER ON CONSENT FOR RI/FS FOR OU4
	)	
	)	Proceeding under Sections 104, 122(a), and 122(d)(3) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9604, U.S. 9622(a), and 9622(d)(3)
Blue Tee Corp., and Gold Fields Mining Corporation, and the U.S. Department of the Interior	)	
	)	
Respondents	)	

THE UNDERSIGNED SETTLING PARTY enters into this Agreement in the matter of Tar Creek Superfund Site, CERCLA Docket Number 6-03-01, relating to the Remedial Investigation and Feasibility Study for Operable Unit 4 at the Tar Creek Superfund Site, Ottawa County, Oklahoma:

FOR SETTLING PARTY: THE UNITED STATES DEPARTMENT OF THE INTERIOR

Address

By: Aurene M Martin DEC 05 2003

Signature Date

Aurene M. Martin

Principal Deputy Assistant Secretary Indian Affairs

Print name and title of Signatory

ATTACHMENT 1
STATEMENT OF WORK ("SOW")
TAR CREEK SUPERFUND SITE OPERABLE UNIT 4

I. INTRODUCTION

1. This Statement of Work ("SOW") sets forth certain requirements for the development of a Remedial Investigation and Feasibility Study ("RI/FS") to address the contamination from former mining, milling, and smelting operations at Operable Unit 4 ("OU4") of the Tar Creek Superfund Site (the "Site"). Respondents shall undertake the work according to this SOW.

2. The purpose of the RI is to determine the nature and extent of the contamination resulting from mining, milling, and smelting operations in Operable Unit 4 and to provide data for United States Environmental Protection Agency, Region VI's ("EPA's") development of a Baseline Risk Assessment. The Baseline Risk Assessment includes a Human Health Risk Assessment ("HHRA") and Ecological Risk Assessment ("ERA"). For purposes of this SOW, the term "COPC" shall mean lead, zinc, and cadmium. The Respondents' RI work shall emphasize data collection and site characterization, and Respondents shall perform the RI work concurrently and in an interactive fashion with their FS. The Respondents' RI shall include sampling and monitoring, as specified in this SOW. In this regard, Respondents' RI work shall include the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives. Previous extensive work has been performed on Operable Unit 1 (Surface and Ground water) and Operable Unit 2 (Residential) of the Site. Also, extensive data has been collected from other mining related Superfund sites in Region VII and by the Oklahoma Department of Environmental Quality ("ODEQ") on the Tar Creek site. Therefore, EPA will allow the use of this existing data to the greatest extent technically practicable in the completion of the RI. EPA will review and approve the existing data for use in the RI and Risk Assessments prior to the Respondents' preparation of the RI/FS Workplan. Respondents shall incorporate into the RI any data or information generated by the Inter-Tribal Environmental Council of Oklahoma and contained in the Draft Remedial Investigation Report for the Tribal RI/FS Pilot Project and the Draft Work Plan developed for the Beaver Creek RI/FS.

It is not the purpose of the RI to address surface water degradation by the discharge of acid mine water, nor is it the purpose of the RI to address the threat of contamination of the Roubidoux Aquifer by the downward migration of acid mine water from the overlying Boone Aquifer since those issues have been memorialized and addressed in the EPA's Record of Decision ("ROD") for OU1 (June 6, 1984; Surface Water and Ground Water). Moreover, except as specifically provided in this SOW, it is not the purpose of the RI to address the residential portions of the Site since those issues were memorialized and addressed in the EPA's ROD for OU2 (August 27, 1997; Residential). Respondents' RI shall address rural residential areas located in OU4 that are immediately adjacent to areas where mine and mill residues and smelter waste were deposited by mining, milling or smelting operations.

3. The purpose of the FS is to develop and evaluate alternatives for remedial action at OU4. The EPA has developed extensive information regarding the remediation of residential properties as part of OU2, and EPA intends that, to the extent that the FS for OU4 addresses the limited number of residential properties that are located on OU4, the FS will use the information already developed for OU2 and will include information collected by Respondents on OU4 rural residential areas. The Respondents' Tar Creek OU4 FS work shall emphasize data analysis. To the extent feasible, Respondents shall perform the FS concurrently and in an interactive fashion with their RI work, using data gathered during the RI and any other applicable data. The Respondents shall use the RI data to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives. The EPA will allow the use of FS work completed by the Respondents or other entities at the EPA's Region 7 Superfund Sites in the Kansas and Missouri portions of the Tri-State Mining District to the greatest extent technically practicable in the preparation of the FS for OU4. Accordingly, the FS documentation from Kansas and Missouri shall be incorporated into this FS, as appropriate, after the review and approval of that FS documentation by EPA for use at OU4. EPA's reviews will be accomplished during the course of the RI/FS process, if they have not been completed before that process is initiated.

It is not the purpose of the FS called for in this SOW to address surface water degradation by the discharge of acid mine water, nor is it the purposes of the FS to address the threat of contamination of the Roubidoux Aquifer by the downward migration of acid mine water from the overlying Boone Aquifer since that issue was addressed in the EPA's Record of Decision ("ROD") for OU1 (June 6, 1984; Surface Water and Ground Water). Moreover, except as specifically provided herein, it is not the purpose of the FS to address the portions of the Site that are primarily residential since those issues were addressed in the EPA's ROD for OU2 (August 27, 1997; Residential).

II. PERFORMANCE STANDARDS

4. The Performance Standards for the work shall include substantive requirements, criteria, or limitations which are described in the Administrative Order on Consent ("Order") including, but not limited to, this SOW. EPA-approved submissions are an enforceable part of the Order; consequently, schedules, cleanup goals and other substantive requirements, criteria, or limitations which are described in EPA-approved submissions are Performance Standards.

5. EPA will use the Performance Standards to determine if the work, including, but not limited to, the development of a RI/FS, has been completed by the Respondents.

6. Respondents shall perform the RI/FS except for the Baseline Risk Assessment. EPA will perform the HHRA and ERA, including identification of potential receptors, in accordance with the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final (U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01; hereinafter the RI/FS Guidance), and in accordance with the EPA guidance documents listed in Attachment A to this SOW. The Respondent shall use best efforts to ensure the confidentiality of data that has been identified to Respondents as culturally sensitive data.

7. Respondents shall not follow the RI/FS Guidance to the extent that it is inconsistent with the National Contingency Plan ("NCP") as specified by EPA in writing.

III. ROLE OF EPA

8. EPA's approval of deliverables, including, but not limited to, submissions, is administrative in nature, and allows Respondents to proceed to the next steps in implementing the work. EPA retains the right to disapprove deliverables until termination of the Order as described in Section XXIX of the Order. EPA may disapprove deliverables including submissions concerning such matters as the contractor selection, plans and specifications, schedules, work plans, processes, sampling, analysis, and any other deliverables within the context of the Order. If a submission is unacceptable to EPA, EPA may require the Respondents to make modifications in the submission, and EPA may require the Respondents to do additional work to support those modifications. That is, if a submission reports certain work that was improperly performed or performed not consistent with the EPA-approved Work Plan, EPA may require Respondents to modify the submission text and to redo the underlying work. Subject to Respondents' rights under Article XX of the Order Dispute Resolution, the Respondents shall modify the submission and redo the work as required by EPA.

9. At the completion of the RI/FS as determined by EPA, EPA will, in accordance with the NCP, select a remedy for OU4 and memorialize its selection in a ROD. EPA may prepare separate RI/FSs and separate RODs for other parts or operable units of the Site. As provided in 42 U.S.C. § 9604(c)(2), the EPA will consult with the Quapaw Tribe and the Oklahoma Department of Environmental Quality ("ODEQ") before determining any appropriate remedial action to be taken for OU4.

10. EPA will oversee Respondents' work activities throughout the RI/FS. Respondents shall cooperate fully with EPA's oversight activities. EPA will prepare the HHRA and ERA based upon available data and data that Respondents shall collect during the RI.

IV. RESPONDENTS' KEY PERSONNEL

Respondents' Project Coordinator

11. When necessary EPA, the ODEQ, and the Quapaw Tribe will meet with the Respondents and discuss the performance and capabilities of the Respondents' Project Coordinator. When Project Coordinator performance is not satisfactory, as determined by EPA, the Respondents shall take action, as requested by EPA, to correct the deficiency. If, at any time, EPA determines that the Project Coordinator is unacceptable for any reason, the Respondents, at EPA's written request and subject to Respondents' rights pursuant to Article XX of the Order Dispute Resolution, shall bar the Project Coordinator from any work under the Order, and, pursuant to the provisions of paragraph 69 of the Order, give notice of Respondents' selected new Project Coordinator to EPA.

Quality Assurance Official

12. Oversight by the Quality Assurance Official ("QAO") (see paragraph 39 of the Order) will be used to provide confirmation and assurance to the Respondents and to EPA that the Respondents are performing the work, including without limitation the RI/FS, to meet Performance Standards. The QAO shall selectively test and inspect work performed by Respondents.

V. WORK TO BE PERFORMED

EPA and Respondents agree that they will both strive to complete all RI/FS activities within two years. To accomplish this objective, the Respondents shall, when practicable, simultaneously work on multiple deliverables, and EPA shall expeditiously complete its review and approval of deliverables.

Scoping Phase

13. Within 45 days of the effective date of the Order, Respondents shall submit to EPA for EPA review and approval (with copies to the ODEQ and the Quapaw Tribe) a written document which is a **Scoping Phase Work Plan** which shall include plans and schedules for Respondents' development of the scoping phase submissions consistent with the schedule set forth in this SOW. The Scoping Phase Work Plan is a submission. The schedule shall include time for EPA review of the various submissions and other deliverables. If EPA review of submissions does not meet the schedules in the EPA-approved Scoping Phase Work Plan, then any delay caused by EPA shall be considered a Force Majeure.

14. **Data Gap Analysis.** Extensive data collection, special studies, analyses, modeling, and other information gathering and evaluation have been conducted at the Site as part of detailed investigations of the entire area for OU1 and OU2 RI/FS activities. Moreover, comprehensive multidisciplinary RI/FS environmental investigations have been conducted throughout the Tri-State Mining District, and in particular at sites in Jasper County, Missouri and Cherokee County, Kansas, which have generated data and analyses which are relevant to the OU4 RI/FS. As the main element of the Scoping Phase, Respondents shall perform a detailed data gap analysis. The purpose of this data gap analysis shall be to identify, compile, organize, analyze, and summarize all available data pertinent to the OU4 RI/FS, and to identify additional data that is needed to fulfill the requirements of the RI/FS as identified in various parts of this SOW. That is, Respondents shall identify gaps in the data. Within 120 days of approval of the Final Scoping Phase Work Plan, the Respondents shall submit the results of that data gap analysis in the form of a **Data Gap Analysis Report** to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review and approval. The Data Gap Analysis Report is a submission. The Respondent shall include compiled data, that has been analyzed and presented in tabular form, in the Data Gap Analysis Report. The Respondents shall also include a narrative that explains where data is still needed to complete the RI/FS. Respondents' data gap analysis shall examine the data that underlies the analysis in any report that Respondents' include in their data gap analysis. As part of the data gap analysis, Respondents shall analyze existing data to determine whether more data must be obtained to define source areas of COPC in order to define the potential pathways of COPC migration and to develop and evaluate remedial action alternatives (including the no-action alternative). Respondents shall, in the Data Gap Analysis Report, evaluate the need, if any, for additional OU4 data relative to meeting the preliminary remedial action objectives

established by EPA (in coordination with ODEQ and the Quapaw Tribe). EPA will provide the preliminary remedial action objectives to the Respondents in writing within 30 days of the effective date of the Order. (EPA will provide copies to the ODEQ and to the Quapaw Tribe). If EPA or Respondents determine that additional data are needed, Respondents shall describe the additional data needed in the Data Gap Analysis Report and, as part of the Data Gap Analysis Report shall propose, for EPA review and approval, Data Quality Objectives ("DQOs") for the needed data consistent with "Data Quality Objectives for Remedial Response Activities," OSWER Directive No. 9335.0-7B (March 1987) (the DQO Guidance). Respondents shall develop DQOs that shall, at a minimum, require the use of analytical methods that are sufficient for identifying the nature and extent of COPC and that are sufficient for determining whether COPC contamination concentration levels exceed remediation goals identified by EPA as provided 40 CFR 300.430(e)(2)(i). EPA shall advise Respondents of its approval of existing data to be used prior to Respondents' preparation of the RI/FS Work Plan.

15. **Develop a Conceptual OU4 Model.** The Conceptual OU4 Model describes the exposures to be addressed in the risk assessments. Within 30 days of the effective date of the Order, EPA shall provide Respondents with all information relative to the risk assessment necessary so that Respondents can develop the **Conceptual OU4 Model**. Respondents shall use the information provided by EPA and existing data to develop a Conceptual OU4 Model as described in the RI/FS Guidance at Section 2.2.2.2 (Develop a Conceptual Site Model) and at Figure 2-2 of the RI/FS Guidance. The Conceptual OU4 Model is a submission. Respondents shall include, in the Conceptual OU4 Model, the sources of contamination in the chat piles, chat bases, mill related ponds, smelter wastes, and affected soils that are located in OU4. Respondents shall include, in the Conceptual OU4 Model, known and potential routes of migration of metals, and affected media (ground water, soil, surface water, sediments, and air). Respondents shall include in the Conceptual OU4 Model known and potential human receptors identified by EPA. Within 120 days of EPA's approval of the Final Scoping Phase Work Plan, the Respondents shall submit a Conceptual OU4 Model to EPA for EPA review and approval (with copies to the ODEQ and the Quapaw Tribe).

16. **RI/FS Work Plan.** Within 60 days after the meeting on the Data Gap Analysis Report and receipt of EPA's approval of the existing data to be used in the RI, Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe), for EPA review and approval, a written document which is a **RI/FS Work Plan**. The RI/FS Work Plan is a submission. Respondents shall develop a RI/FS Work Plan which is in accordance with the RI/FS Guidance (see Appendix B of the RI/FS Guidance). Respondents shall include in the written RI/FS Work Plan plans and schedules for Respondents' development of the submissions described in this SOW. The plans and schedule that Respondents include in the RI/FS Work Plan shall be consistent with the schedule contained in paragraph 55 of this SOW and with other deadlines contained elsewhere in this SOW. The schedule that the Respondents include in the RI/FS Work Plan shall provide due dates for deliverables taking into consideration coordinating activities with EPA, ODEQ and the Quapaw Tribe. If EPA review of submissions does not meet the schedules in the EPA-approved RI/FS Work Plan, then any delay caused by EPA shall be considered a Force Majeure.

17. **Sampling and Analysis Plan.** Within 45 days of EPA's approval of the final RI/FS Work Plan, Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe), for EPA review and approval, a written document which is a **Sampling and Analysis Plan** ("**SAP**"). The SAP is a submission. Respondents shall design the SAP in a manner which ensures that sample collection and analytical activities are conducted in accordance with technically acceptable protocols. Respondents shall design the SAP in a manner which ensures that the data collected meet DQOs, as defined in the Data Gap Analysis Report. In the SAP, Respondents shall include, a written **Field Sampling Plan** ("**FS**") and a written **Quality Assurance Project Plan** ("**QAPP**"). In the FSP, Respondents shall define, in detail, the sampling and data-gathering methods that shall be used for OU4. Respondents shall include OU4 background information, sampling objectives, a description of sample locations, sampling frequency, a description of sampling equipment and procedures, and a description of sample handling and analysis requirements in the FSP. In writing the SAP, Respondents shall follow the format described in Table 2-4 (Suggested Format for SAP [FSP and QAPP]) of the RI/FS Guidance, as appropriate. In the QAPP, Respondents shall describe the project objectives and organization, the functional activities, and the quality assurance and quality control ("QA/QC") protocols that Respondents shall use to achieve the desired DQOs.

Respondents, in the QAPP, shall address sampling procedures, sample custody, analytical procedures, data reduction, validation, reporting and personnel qualifications. In the QAPP, Respondents shall describe the procedures which Respondents shall use to ensure the following requirements of this SOW:

a. Respondents shall require Respondents' personnel and contractors to attend EPA QA/QC training and orientation if specified by EPA.

b. Respondents shall demonstrate, in advance, to EPA's satisfaction, that each laboratory Respondents may use is qualified to conduct the work to be performed under this SOW.

c. Respondents shall use laboratories which use methods and analytical protocols which are within detection and quantification limits that are consistent with EPA QA/QC procedures including without limitation Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures, OSWER Directive Number 9360.4-01; Environmental Response Team Standard Operating Procedures, OSWER Directive Numbers 9360.4-02 through 9360.4-08.

d. Respondents shall use laboratories which follow an EPA-approved QA program.

e. If Respondents use a laboratory which is not in EPA's Contract Laboratory Program ("CLP"), Respondents shall ensure that the laboratory uses methods consistent with EPA CLP methods, as determined by EPA.

f. If Respondents use a laboratory which is not in EPA's CLP program, Respondents must submit a laboratory QA program for EPA review and approval, before Respondents use the laboratory in question.

g. At EPA's request, Respondents shall provide EPA with detailed information to demonstrate that any laboratory used by Respondents is qualified to conduct the work, including without limitation information regarding personnel qualifications, equipment, and material specifications. Respondents' use of any laboratory for work under the Order is subject to EPA's disapproval pursuant to paragraph 38 of the Order. If, at any time, EPA determines that any laboratory used by Respondents is unacceptable for any reason, the Respondents, at EPA's request, shall bar that laboratory from any work under the Order, and give notice of Respondents' selected new laboratory to EPA.

h. Respondents shall provide EPA with unlimited access to laboratory personnel, equipment, and records, including access to laboratory personnel during sample collection, during sample transportation, and during sample analysis.

18. **Health and Safety Plan.** Within 45 days of Respondents' receipt of EPA's approval of the RI/FS Work Plan, Respondents shall submit a written OU4 **Health and Safety Plan** prepared in conformance with applicable Occupational Safety and Health Administration ("OSHA") and EPA requirements, including, but not limited to OSHA regulations in 29 CFR Part 1910 (54 Fed. Reg. 9294). The Health and Safety Plan is a submission. Respondents shall include without limitation the 11 elements described in the RI/FS Guidance at Section 2.3.3 (Health and Safety Plan) and at Appendix B including, but not limited to, a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and site control. EPA will not approve the Health and Safety Plan, but may disapprove the Health and Safety Plan.

19. **Community Relations Plan.** The EPA shall develop a written document which is a **Community Relations Plan ("CRP")** which describes EPA's community relations activities. Respondents shall support the CRP in providing representatives for public meetings and open houses at EPA's request. Respondents shall assist EPA in the preparation and mailing of fact sheets and meeting notices advertisements for meetings, the preparation of visual aids for meetings (including photographs, maps, and aerial photographs), and the preparation and duplication of handouts for meetings.

20. **Data Security System.** Within 45 days of Respondents' receipt of EPA approval of the RI//FS Work Plan, Respondents shall submit to EPA (with copies to the ODEQ and the Quapaw Tribe), for EPA review and approval, a written plan describing the data security system for the RI. Respondents shall develop a data security system which provides measures that Respondents shall take in the field to safeguard chain-of-custody records, and to prevent free

access to project records, thereby guarding against accidental or intentional loss, damage, or alteration of those records. Respondents shall follow the procedures in the EPA-approved data security system during the time that the Order is in effect.

Site Characterization.

21. Extensive previous work has been performed to characterize the mine and mill residues and smelter wastes located in the Tri-State Mining District, including the Site. Mine and mill residues have been studied extensively, and existing aerial imagery exists to define the spatial distribution of these materials at the Site historically (since 1939) and contemporaneously (2002). Extensive data on mine and mill residues have been collected to determine the nature and extent of the COPC sources that may result in the release of COPC to the environment.

22. The site characterization phase for OU4 will consist of five major components: (1) evaluation and use of existing data; (2) field investigations; (3) laboratory analyses of field samples; (4) risk assessment; and (5) data management. EPA will perform the risk assessment component. Respondents shall perform the other four components. Extensive data collection, special studies, analyses, modeling, and other information gathering and evaluation have been conducted at the Site as part of detailed investigations of the entire area for OU1 and OU2 RI/FS activities. Moreover, comprehensive multidisciplinary RI/FS environmental investigations have been conducted throughout the Tri-State Mining District, and in particular at sites in Jasper County, Missouri and Cherokee County, Kansas and the results of these investigations provide some pertinent and comparable data and analyses. Therefore, Respondents need only perform field investigations and laboratory analysis with respect to the additional data needs identified in the EPA approved Data Gap Analysis Report. For the parts and aspects of OU4 where the EPA-approved Data Gap Analysis Report found that existing data was adequate, Respondents may rely on existing data for site (*i.e.* OU4) characterization. Respondents shall ensure that the field methods, sampling procedures, and chain of custody records are consistent with EPA's A Compendium of Superfund Field Operations Methods, (Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14, hereinafter the Compendium).

Field Investigation

23. **Investigate Site Physical and Chemical Characteristics.** Respondents shall compile or collect,[1] data on the physical and chemical characteristics of OU4 to define the distribution and concentration of COPC, COPC transport pathways, and COPC receptor populations; and to provide sufficient engineering data for development and screening of remedial action alternatives for OU4. Respondents shall collect information on the surface features; mine and mill residues and smelter wastes; transition zone soils; near field sediment transport from chat piles; and surface water transport from chat piles, as described in the sections that follow. Respondents shall use a geographic information system ("GIS") to organize, analyze, plot, and display key data sets. Respondents shall utilize the Environmental Systems Research Institute ("ESRI") ArcView GIS system unless EPA approves another GIS system at Respondents' request. Respondents shall use the GIS as a focal point for database management, research, analysis, and reporting.

24. **Surface Features.** Respondents shall compile or collect data on OU4 surface features including, without limitation: mine shafts, subsidence features, fencing, property lines and utility lines, roadways; railways, drainage ditches, leachate springs, surface water bodies, flood plains, vegetation, topography, residences, commercial buildings, and other man-made structures. In order to develop historical data regarding surface features, Respondents shall review existing data including without limitation historical aerial photographs and topographic surveys. Respondents shall develop a description of existing OU4 surface features using aerial photography, surveying, mapping, and an OU4 field reconnaissance inspection augmented with digital photographs. Respondents shall georeference surface features and enter them into the GIS.

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[1] Hereinafter if the SOW calls for Respondents to compile or collect data it means that if the data exists as reported in the EPA-approved Data Gap Analysis Report, then Respondents need only compile the data, but, if the Data Gap Analysis Report finds that additional data are needed in any area, then Respondents must collect the data in the field. However, regarding sampling, Respondents need only collect the samples described in paragraphs 25 through 32 of the SOW.

25. **Mine and Mill Residues and Smelter Waste.** Respondents shall compile or collect data on the location, area, and volume of current and former mine and mill residues and smelter waste accumulations at the Site by major category, including waste rock, development rock, overburden, chat piles, screened chat piles, mill related ponds, and smelter waste accumulations. Respondents shall use a three step process to develop the necessary understanding of the distribution of mine and mill residues and smelter wastes at the Site. These steps include: 1) Aerial imagery analysis, including volumetric analysis; 2) Field reconnaissance, verification and groundtruth; and 3) Sampling and analysis of mill residues and smelter wastes. The location and volume of overburden and development rock will be mapped, but not chemically sampled as it has been shown not to be a significant source (if any) of COPC.

26. **Aerial Imagery Analysis.** Respondents shall make an inventory of existing mine and mill residues and smelter wastes including chat piles, chat bases, mill-related ponds, and other mining related accumulations at the Site by using aerial photographic technology followed by ground confirmation and volumetric calculations. Respondents shall acquire the most recent available data and use the data in conjunction with historical air photographs to develop updated inventories and maps of chat piles, chat bases, mill-related ponds, and other accumulations of mine- or mill-related material. Aerial Data Service, Inc., Tulsa, Oklahoma owns a set of 1999 aerial imagery taken to nominal 1 foot contour interval of the entire Site. Respondents shall acquire these data or equivalent, plot the imagery and, and analyze it as part of the inventory process. Also as part of the inventory process, Respondents shall make observations and use remote sensing imagery to update the 1999 data, as appropriate, since it is anticipated that there have been some changes to the local distribution of chat due to chat use since 1999. As part of the inventory, Respondents shall compile or collect volumetric data (surficial and subsurface) regarding the following OU4 materials: waste rock, development rock, overburden, chat (noting, in addition to the volume, whether the piles are vegetated or nonvegetated), fine tailings accumulations in mill-related ponds and elsewhere, other mine and mill residue and smelter wastes. Respondents shall confirm and update existing documentation concerning the areal extent and volume of all chat piles, chat bases, and mill-related ponds, and other accumulations of mine- or mill-related material, including without limitation those documented in Brown and Root's ("B&R") 1995 inventory and those documented in the U.S. Army Corps of Engineers ("USACE") 1999 aerial photographs .

Respondents shall enter the information into ArcView GIS for documentation and quantitative analysis purposes. During the RI/FS process, Respondents shall use the GIS as a focal point for database management, research, analysis, and reporting. Respondents shall organize the GIS to contain, sort, and provide access to data regarding mine and mill residues and smelter wastes. Respondents shall include the following information in the GIS: location, name, ownership, areal extent, and approximate volume of all chat piles, chat bases, mill-related ponds, and other accumulations of mine- or mill residues located on OU4 (regardless of ownership).

27. **Field Reconnaissance.** Respondents shall conduct a field reconnaissance after the initial aerial photo analysis, to perform a general classification of mine and mill residues and smelter wastes (screened chat, chat, chat bases, mill- related ponds, smelter waste accumulations). Respondents shall implement general field screening using a standard sieve protocol to distinguish between chat and screened chat. Areas where chat has been removed for commercial purposes will be identified along with chat bases. The field reconnaissance will allow for proper classification of the mine and mill residues and smelter wastes, and as groundtruth for the GIS. The field reconnaissance effort will also contribute to specific tasks as discussed below in soils and surface water investigations.

Sampling and Analysis

28. **Mine and Mill Residues and Smelter Waste**. Respondents shall undertake soil and sediment sampling and analysis to determine the physical and chemical characteristics of the mine and mill residues and smelter waste, to support the FS performed by Respondents, including the evaluation of different alternative treatment processes and scenarios. In conducting the sampling and analysis, Respondents shall give priority to those areas which a) have been studied previously, b) are in close proximity to OU4 residents, c) are in close proximity to OU2 residents, and d) are in direct drainage to Tar Creek, Lytle Creek, Beaver Creek, or Elm Creek. Respondents shall follow specific protocols for each type of mine and mill residues and or smelter waste that Respondents sample and analyze, as defined in the SAP.

Respondents shall collect 8 samples from each of 15 representative chat and 5 screened chat piles,[2] for a total of 160 samples. Respondents shall sample the chat and screened chat in accordance with ASTM Book of Standards Volume 04.08 (March 2002) Soil and Rock protocols. Respondents shall collect the samples using ATSM's bulk sampling techniques from a freshly cut, exposed portion of the chat or screened chat pile being sampled. Respondents shall make the cut using a backhoe, front-end loader or similar construction equipment. Respondents shall analyze the samples of chat or screened chat for particle size (to differentiate chat from screened chat) and COPC concentrations.

Respondents shall analyze for COPC in all samples. In addition, Respondents shall analyze approximately 10% of the samples for all metals using EPA SW846 Method 6010 to support the HHRA.

Respondents shall randomly select 8 of the chat and screened chat piles discussed above and Respondents shall collect two surface samples (0 to 1 inch) from each of the selected 8 piles to support the HHRA. In selecting the 8 chat and screened chat piles, Respondents shall maintain, as close as possible, the overall ratio of chat piles and screened chat piles. Respondents shall screen each of the 16 samples and analyze only the less than 250-micron size fraction for COPC.

Based upon the field reconnaissance, Respondents shall select 4 representative chat bases for sampling and analysis. Respondents shall collect a total of 4 samples from each of the 4 representative chat bases for a total of 16 samples. Respondents shall collect the chat base samples using the bulk sampling techniques discussed above for chat piles. Respondents shall analyze the chat base samples for particle size and COPC.

Respondents shall collect 10 samples of fine mill tailings from each of 10 mill-related ponds for a total of 100 samples. Respondents shall drill and use depth-integrated sampling to obtain depth integrated samples and to determine the depth of fine mill tailings or other materials deposited in mill-related ponds. Respondents shall analyze the 100 samples for COPC. Respondents also shall analyze 10% of the samples for all metals using SW 846 Method 6010 to support the HHRA.

Respondents shall compile or collect data on the concentration of COPC in smelter waste located on and near the Ottawa smelter (at Hockerville, 3 miles northeast of Picher, OK.) Smelter waste includes the materials that were piled near the smelter, including slag (the oxides of gangue materials produced by gravity separations from molten metals), and flux (Si-Al-CaO composite, an additive used to separate iron from sulfides). Because the slag and flux materials have been shown not to contribute significantly to COPC in contamination, Respondents shall take only 5 composite grab samples of nearfield smelter waste (slag and/or flux) from identified smelter waste accumulations. Respondents shall analyze the smelter-waste samples for COPC which will allow Respondents to characterize smelter waste located on OU4.

Respondents shall use the samples taken under this paragraph (SOW paragraph 28) and other existing information to characterize the mine and mill residues and smelter waste in the Remedial Investigation (RI). In the RI, the Respondents shall determine whether the characteristics of the mine and mill residues of OU4 are similar to the characteristics of previously tested mine and mill residue concentrations found on the Site and in Jasper County, Missouri and Cherokee County, Kansas. Respondents shall use parametric (and possibly nonparametric) statistical comparisons in order to determine whether COPC concentrations in the samples are similar to the concentrations found in the previously tested mine and mill residues. Respondents shall also gather information on the use of chat from the Site including descriptions of chat operations, uses of chat, the rate of chat removal, as well as the existing and potential future environmental and safety controls associated with the excavation and use of chat. Respondents shall also collect information on past and current ownership of mine and mill residues and mined land in the Site. Respondents shall summarize this information in the RI report.

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[2] Although Respondents are not required to sample more than 20 piles under this paragraph, EPA may decide, based on field reconnaissance to change the number of samples from each type of pile ((i.e., screened chat or chat) to be sampled. For example, EPA may decide that Respondents should collect the samples from 7 screened chat piles and 13 chat piles.

29. **Soils – Transition Zone, Residential, and Smelter-Affected**

Respondents shall perform field and laboratory investigations of soils to include: 1) transition zone soils, 2) residential soils, and 3) smelter- affected soils as described below.

Transition Zone Soils. Respondents shall compile or collect data from transition zone soils to confirm and/or update existing documentation concerning the areal extent of all transition zone soils including, without limitation, those transition zone soils documented in B&R's 1995 inventory and those documented in the USACE's 1999 aerial photographs. Respondents shall create a computer database to contain, sort, and provide access to the transition zone data including location, name, ownership, and areal extent of each transition zone (regardless of ownership).

Respondents shall investigate the lateral and vertical extent of COPC migration from 5 isolated chat piles. This information and other available existing information will be used to define a practical outer limit for COPC affected soils, which will then be applied to the definition of all near-pile soils in the Site area using the GIS using the transition zone concept.

Soil samples will be collected by the Respondents at 0, 5, 10, 20, 40, 70, 120, 200, and 300 feet intervals from both upwind and downwind sides to detect wind effects. The Respondents will determine the vertical extent of transition zone soils by collecting composited soil samples taken as coreplug samples at the following depths: surface (0 to 1"), 6 inches, 12 inches, and 24 inches below ground surface. Each discrete depth sample shall represent no more than one inch above or below the prescribed depth.

Respondents shall chemically analyze for COPC each soil sample sequentially outward beginning with the sample taken at the surface and 0 feet distance from the pile for the COPC until the distance and depth are reached where soil concentrations are statistically equal to or less than twice the background soil COPC concentrations as determined in the Jasper County Superfund Site RI (e.g., cadmium – 8 mg/kg; lead – 180 mg/kg; and zinc – 844 mg/kg). These analyses will define the distance and depth of COPC migration and will be used to define the limits of the transition zone soils. Any soil contamination from seeps and runoff channels that go beyond the transition zone soil, including the seeps and runoff channels, shall be mapped and included in the project GIS.

Residential Soils. Over 60 composite soil samples were taken from rural residences during the OU2 RI/FS studies at the Site. Other residences in OU4 that were not sampled during OU2 shall be sampled by the Respondents using EPA-established sampling protocols and samples shall be analyzed for COPC. Respondents shall sieve a percentage of these samples and analyze the less than 250 micron size fraction for EPA's use in the HHRA.

Respondent shall collect front and backyards soil samples on residential properties previously not sampled in rural areas. If Respondents find the soil lead concentrations are greater than the soil lead screening level of 400 mg/kg, in a residential yard, then the Respondents shall also sample those properties for indoor dust lead levels and evaluate the sources of lead in the yard soil and in house dust.

Smelter-Affected Soils. Respondents shall collect composite soil samples from surface to 6" inches deep at distances from 0 to 5000 feet (or until chat or mill residues locations are encountered), at 200 foot intervals upwind and downwind from the approximate center of the historical Ottawa smelter stack to define the extent of smelter affected soils. Respondents shall analyze the collected samples for COPC sequentially, beginning with the samples closest to the smelter stack, until the COPC levels are equal to or less than twice the background concentration of COPC (e.g., cadmium – 8 mg/kg; lead -180 mg/kg; zinc – 844 mg/kg) in soil. Respondents shall plot the smelter affected soils data on the GIS.

30. **Surface Water**

Surface water was previously extensively studied during OU1 activities. For OU4, Respondents shall: 1) collect data on the runoff and seepage from 2 representative chat piles, so that calculations and predictions can be made on the metal loadings to nearby drainages, and 2) determine the relative contribution of COPC from mine and mill residues via surface water runoff (as compared to groundwater sources) in Tar Creek, Lytle Creek, Beaver Creek, and Elm Creek.

1) Runoff and seepage from chat to surface water - Respondents shall determine stormwater runoff and seepage characterization from 2 representative chat piles, and their metal loading contributions to surface waters. Respondents shall update and refine the study conducted over 20 years ago by the Oklahoma Water Resources Board which estimated the metal loadings from seepage and runoff from accumulated mine tailings in the Tar Creek basin. During the field reconnaissance, Respondents shall collect information on the identification and location of the channels that drain accumulated mill tailings. Respondents shall georeference and enter these areas into the GIS.

Respondents shall determine the metal loadings related to seepage/runoff during dry and wet periods at the 2 representative locations to be selected in coordination with EPA, ODEQ, and the Quapaw Tribe. Representative chat piles with defined runoff pattern will be selected, and an appropriate location selected for the Respondent's installation of a modern solid-state hydrological monitoring station, including pressure transducer, data logger, and automatic flow activated water quality sampler at each of the 2 representative piles. Respondents shall determine a rating curve for the pressure transducer installed in open channel, weir or flume and shall program the samplers to activate during runoff conditions. The amount of sediment that is transported from the representative (instrumented) chat piles will also be determined by the Respondents during wet periods to evaluate the significance of this mechanism for transport of COPC from the pile to nearby soils and drainages. Total suspended sediment will be sampled and analyzed from the automatic composite sampler for COPC.

2) Surface water versus ground water transport of COPC to surface water -Respondents shall conduct a field reconnaissance to determine those areas which are upstream and downstream of potential chat pile runoff in Tar Creek, Lytle Creek, Beaver Creek, and Elm. Respondents shall take dry weather samples at 2 strategic locations (upstream and downstream) of chat pile inputs on each of the 4 creeks (Tar Creek, Lytle Creek, Beaver Creek, and Elm Creek -total of 8 locations) to determine baseline conditions which assume groundwater input. During wet weather runoff events, Respondents shall sample these 8 stations again, using composite, flow proportional sampling, to determine concentrations of COPC. Respondents shall install an onsite precipitation gage (e.g., tipping bucket or other approved precipitation monitor) at each of the stations. At the time of sampling, field measurements of pH, total suspended sediment, turbidity, alkalinity, conductivity, and temperature will be made using modern water quality field instrumentation approved by EPA. Respondents shall conduct these activities using up-to-date equipment and methodologies.

Respondents shall determine the relative contribution of COPC from surface water runoff as compared to groundwater contributions using mass balance calculations comparing the low flow sampling results to the wet weather sampling results. Background levels of the target metals will be determined and measured during low flow conditions in Tar Creek, Lytle Creek, Beaver Creek, and Elm Creek.

31. **Ground Water.** Respondents shall conduct an updated inventory of rural wells in the shallow aquifer and sample shallow aquifer wells used for domestic purposes, if any are identified. Groundwater was the subject of the RI/FS evaluation under OU1, and the contribution of metals from mine and mill residues to ground water is outside the scope of OU4. Respondents shall summarize the existing information on groundwater quality for domestic use from the shallow aquifer and the existing data on water-filled subsidence areas and mine workings for consideration of sub-aqueous disposal of mine wastes in the FS. Respondents shall sample any identified shallow wells in OU4 that are being used for domestic purposes in accordance with the standard EPA protocols involving clean techniques. Respondents shall sample wells at an available tap nearest to the well after an initial flush. Groundwater samples collected will be analyzed for COPC.

32. **Ecology.** For the ecological risk assessment, EPA will be conducting a conservative ERA based on OU4 media data which will include assessment of direct contact toxicity and assessment of adverse effects associated with conservative food chain dose estimates. Additional ecological endpoints will be considered in the ERA, if needed by the Quapaw Tribe. Adequate detection limits for the analytes will be needed, i.e. lower than the ecotoxicity screening values. Respondents shall characterize the terrestrial ecology of the Site, including, but not limited to, the flora and fauna in the area for use in the environmental characterization for EPA's ERA. Aquatic ecological considerations will be limited to comparisons of aquatic media COPC concentration to conservative and eco-toxicity screening values.

Flora. Respondents shall identify, characterize and map vegetation communities, including identifying state or federally protected species (with the required approval from State and Federal trust resource agencies). It is anticipated that recent Landsat satellite imagery will be utilized along with aerial photographs and ground-level observations to create an accurate supervised classification of vegetative communities and habitats on the Site. Respondents shall fuse Landsat Thematic Mapper ("TM") data with 15m resolution panchromatic data to obtain a recent image suitable for interpretation and classification purposes.

Further characterization of local plant communities will be performed by Respondents using point and line-intercept transect and quadrant methodologies, with a special focus on identification of any phytotoxic conditions in the transition zone around chat piles, chat bases and mill-related ponds. Respondents shall establish strategically located transects in each cardinal direction at a total of 10 representative locations in OU4 for sampling and analysis. Specific sampling protocols will be outlined by Respondents in the SAP. Information gained during the on-site field investigations will be used by Respondents as an integral component of the supervised vegetation classification system of the GIS. Phytotoxicity has been demonstrated to be of little or no concern to common local plant species such as grasses, but there may be some plants which are more sensitive than the species tested. The principal limiting factors to flora on chat piles are physico-chemical in nature, as these mill tailings have poor water holding capacity and very low to nonexistent nutrient levels. Research has shown that soil amendments that increase water holding capacity and nutrients (such as addition of organic matter) greatly improves plant germination, growth, and reproduction in mine and mill residues. This has also been shown to be the case for the Tri State Mining District. Information useful for feasibility phase evaluation of revegetation will be collected by Respondents.

Fauna. The Respondent shall list and characterize the potentially expected fauna species for use in the ERA.

33. **Human Health.** EPA will develop a HHRA for OU4. As part of the data needs assessment, Respondents shall assemble data collected from the Tri-State Mining District (i.e. on plants, fish, game tissue, soil, mine and mill residue and smelter waste, chat piles, chat bases, mill-related ponds, transition zone soil, surface water, ground water, sediments, etc.) for use in the HHRA. The assembled data should include information on the number of samples, their location, the types of samples, the results, the quality of the data, etc. The data collected by Respondents from mill residues, soils, and drinking water from private wells will be used in addition to the available data in writing the HHRA. EPA will perform a statistical evaluation of the existing data along with the data that will be collected by Respondents, and correlations between different data in different media in the Tri-State Mining District will be utilized. EPA, with the collaboration of the Quapaw Tribe, will develop a risk assessment specific to the way of life for a typical tribal member.

34. **Geographic Information System.** In creating the GIS, Respondents shall use digital inputs from various sources, and shall organize several data layers representing vector, raster, and attribute data collected during the RI/FS. Respondents shall include the following, which is a summary of the principal data layers anticipated to be included in the study:

Landsat imagery (Landsat Thematic Mapper data fused with 15 m panchromatic)
Aerial photography (1939 to 2002)
Property ownership including tribally controlled properties
Distribution of mine and mill residues (historical and contemporaneous)
Soils, including transition zone soils
Drainages
Sampling locations (residues, rural yards, water, soil, flora, fauna, etc.)
COPC concentration levels
Vegetation (supervised classification)
Threatened and endangered plant species distribution and potential habitats
Predicted airborne lead distributions (isopleths)
Site-specific attribute data
Ground-level photodocumentation

Respondents shall use the GIS for storage, management, analysis, and presentation of all pertinent project data and information. The GIS which Respondents shall use for this particular program shall be based on ESRI Arc View

8.3, which is considered to be one of the most versatile and easy-to-use versions of the ESRI group of GIS programs. Respondents shall develop the GIS to run on a data secure Pentium IV computer (2.4 GHz, 512MB RAM, 120 GB hard drive).

35. **Laboratory Analyses of Field Samples.** Respondents shall perform a laboratory analysis of samples taken during the work described in the SOW. Respondents' laboratory analysis shall conform to the EPA-approved QAPP.

36. **Data Analysis.** Respondents shall analyze the data collected as part of the work performed by Respondents pursuant to the Order. Respondents shall develop or refine the conceptual site model by analyzing data on the following: (i) physical characteristics of OU4, (ii) OU4 mine and mill residues and smelter waste characteristics, (iii) the nature and extent of COPC on OU4, and (iv) fate and transport of COPC on OU4.

Data on Site Physical Characteristics. Respondents shall analyze data on OU4 physical characteristics in order to describe the environmental setting at OU4, including without limitation important surface features, soils, geology, hydrology, meteorology, and ecology. Respondents' analysis of OU4 physical characteristics shall emphasize factors important in determining source fate and transport for all pathways whereby, COPC from mine and mill residues, and smelter waste may migrate.

Data on Site Mine and Mill Residues Ccharacteristics Respondents shall analyze data on OU4 source characteristics including without limitation, the type and integrity of any existing mine and mill residue containment, and the types, quantities, chemical properties, physical properties, and concentrations of COPC found on OU4. Respondents shall evaluate the actual and potential magnitude of releases of each metal. Respondents shall evaluate the mobility and persistence of the release of COPC.

Data on the Nature and Extent of COPC. Respondents shall analyze data on the nature and extent of COPC concentrations at OU4 in mine and mill residues and smelter waste and soil and surface water immediately adjacent to the mine and mill residues and smelter waste. As part of Respondents' analysis of COPC transport pathways, Respondents shall analyze spatial and temporal trends in these COPC. Respondents shall arrange data in tabular or graphical form for clarity. Existing information on the nature and extent of COPC in air will be included by Respondents in their analysis of the nature and extent of COPC contamination.

Data on COPC Fate and Transport. Respondents shall analyze OU4 fate and transport issues relative to the COPC. In Respondents' analyses of fate and transport, Respondents shall combine the results of Respondents' analysis of data on OU 4 physical characteristics, the results of Respondents' analysis of data on OU4 source characteristics, and the results of Respondents' analysis of data on the nature and extent of COPC. Respondents shall use data gathered regarding the release of COPC at OU4 (e.g., the approximate date(s) and circumstances of the release) to analyze the rate of COPC migration in the transport pathway over the period of time between the release and RI monitoring. In the alternative, if, as determined by EPA, there is inadequate information regarding the release, Respondents shall estimate COPC fate and transport on the basis of OU4 physical characteristics and source characteristics. If appropriate, as determined by EPA, Respondents may use analytical or numerical modeling, subject to EPA approval, to analyze metals fate and transport. Respondents' analysis of COPC fate and transport shall be consistent with EPA's Superfund Exposure Assessment Manual (April, 1988).

37. **Data Management Procedures.** Respondents shall consistently and thoroughly document the quality and validity of all data collected during the RI. Respondents shall ensure that RI data management procedures are governed by the DQOs. Respondents shall ensure that the QAPP/FSP shall identify all field-collected data and analytical data collected during the RI.

38. **Field Logs.** Respondents (and/or their consultants or agents) shall produce written daily field log books as the primary record for Respondents' field investigation activities. Respondents shall not modify the EPA-approved procedures described in the RI/FS Work Plan, the EPA-approved procedures in the field sampling plan, or the EPA-reviewed procedures in the health and safety plan, or any other EPA-approved submissions except under the modification provisions of the Order. Respondents (and/or their consultants or agents) shall record, in writing, all field measurements and observations directly into the field log books. The field log books shall include written

entries regarding all field measurements including, but not limited to, pH, temperature, conductivity, water flow, air quality parameters, and soil characteristics. The field log books shall also include written entries describing health and safety monitoring performed by Respondents pursuant to the health and safety plan. The field log books shall include written entries describing sampling locations, sampling techniques, and a general description of Respondents' daily activity. The field log books shall include written entries describing unusual occurrences or circumstances. Respondents (and/or their consultants or agents) shall record data directly and legibly in field log books with entries signed and dated by Respondents or their consultants/authorized agents. Respondents shall not obliterate original field log book entries when changes in written log book entries are made, and Respondents (and/or their consultants or agents) shall sign and date any changes. Standard format information sheets shall be used for written daily log entries.

Preliminary Site Characterization Summary

39. Within 90 days of receipt of the final laboratory sampling results from field investigations, Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe), for EPA review and approval, a written concise **Draft Preliminary Site Characterization Summary**. The Preliminary Site Characterization Summary is a submission. In the Preliminary Site Characterization summary, Respondents shall briefly review, in writing, the results of field sampling and analysis, including the field sampling and analysis described in SOW paragraphs 22 through 36, in order to provide EPA with a reference for evaluating Respondents' development and screening of remedial alternatives and for Respondents' refinement and identification of ARARs. In the Preliminary Site Characterization Summary, Respondents shall provide a written review of Respondents' investigative activities, including the investigative activities describes in SOW paragraphs 22 through 32. In the Preliminary Site Characterization Summary, Respondents shall describe and display OU4 data documenting the location and characteristics of surface and subsurface features and COPC contamination on or near OU4 including, without limitation, the location of contaminated media, types of contamination, physical state of the contamination, concentration of the contamination, and quantity of contaminants. In the Preliminary Site Characterization Summary, Respondents shall describe, based upon data, the location, dimensions, physical condition and varying concentrations of COPC throughout each source, and the extent of contaminant migration through each of the affected media.

Remedial Investigation Report

40. Within 90 days after EPA approval of the Final Preliminary Site Characterization Report and following EPA's completion of the risk assessments, Respondents shall submit, for EPA review and approval, a written **Remedial Investigation ("RI") Report**. The RI Report is a submission. In the RI Report, Respondents shall describe the field investigation work and results of that work, define the sources of COPC contamination, determine the nature and extent of contamination at OU4, and evaluate the fate and transport of COPC. The RI Report shall follow the format described in Table 3-13 of the RI/FS Guidance and shall include text which covers all the topics listed in Table 3-13 (Section 6 (Baseline Risk Assessment) of the RI Report will be provided by EPA). The RI report will include a report summarizing and explaining the results of all the sampling and analysis, all the data compilation and collection, all the other information gathering described in SOW paragraphs 22 through 36.

Treatability Studies

41. **Candidate Technologies Report.** Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review and approval, a written technical document which is a Candidate Technologies Report which describes candidate technologies for potential use in the remedial action for OU4.

42. **Treatability Studies Work Plan**. If EPA determines that practical candidate technologies have not been sufficiently demonstrated in the Candidate Technologies Report or if EPA determines that candidate technologies cannot be adequately evaluated for OU4 on the basis of available information, EPA shall notify Respondents that treatability studies for candidate technologies are required. Within 60 days of receipt of a letter from EPA stating the need to conduct a treatability study, the Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review and approval a written **Treatability Studies Work Plan** describing the work needed and providing schedules for its completion. If required by EPA, the Treatability Studies Work Plan is a

submission. In the Treatability Studies Work Plan, Respondents shall describe the data which must be gathered in order to conduct the treatability studies. Respondents shall describe the type of treatability test which Respondents shall use to test each of the candidate technologies identified by EPA (e.g., bench versus pilot). In the Treatability Studies Work Plan, Respondents shall describe various aspects of the treatability studies including without limitation OU4 background, candidate remedial technologies to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety procedures, and residual waste management. In the Treatability Studies Work Plan, Respondents shall document the DQOs for treatability testing. If pilot-scale treatability testing is to be performed, Respondents shall describe, in the Treatability Studies Work Plan, pilot plant installation and startup, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan for the pilot. If testing is to be performed off-site, Respondents shall describe, in the Treatability Studies Work Plan, permitting requirements and the manner in which Respondents shall meet permitting requirements. Respondents shall perform the work described in the EPA-approved Treatability Studies Work Plan according to the schedules in the EPA-approved Treatability Studies Work Plan.

Respondents shall evaluate, at a minimum, the following areas in considering potential treatability study needs for OU4:

a. Beneficial uses of surficial mill tailings, including commercial reuse (e.g., evaluation of samples of washed chat from commercial chat washing operations, evaluation of chat for road building as an aggregate in asphalt or for road base material [used separately or mixed with an additive such as fly ash, etc.]).

b. Methods to prevent or reduce the potential for recontamination of areas previously remediated.

c. Restoration of contaminated property to beneficial use (e.g., evaluation of the suitability of using former chat pile areas for agricultural land use including phyto toxicity evaluation for target species).

43. **Treatability Study SAP**. If EPA determines that the QAPP or FSP prepared by Respondents to support the remedial investigations is not adequate for defining the activities to be performed during any treatability studies, Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe), for EPA review and approval, a written document which is a separate treatability study SAP.

44. **Treatability Study Health and Safety Plan.** If EPA determines that the Health and Safety Plan prepared by Respondents for the RI is not adequate for the activities to be performed during the treatability study tests, Respondents shall develop a written document which is a separate treatability study Health and Safety Plan and submit it to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review.

45. **Treatability Studies Evaluation Report.** Following completion of the treatability studies, Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe), for EPA review and approval, a written document which is a **Treatability Studies Evaluation Report** which analyzes and interprets the testing results. Respondents shall submit the report to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review and approval. The Treatability Studies Evaluation Report is a submission. Respondents, in the report, shall evaluate each candidate technology's effectiveness, implementability, cost and actual results as compared with predicted results. Respondents, in the report, shall also evaluate full-scale application of the candidate technologies, including without limitation a sensitivity analysis identifying the key parameters affecting full-scale operation.

Feasibility Study

46. **Remedial Action Objectives Refinement.** Respondents shall review the preliminary remedial action objectives established for OU4 by EPA. Respondents shall propose, to EPA (with copies to the ODEQ and the Quapaw Tribe), refinements of the preliminary remedial action objectives based upon the information contained in the Final Preliminary Site Characterization Summary and EPA's Final HHRA, ERA and memorandum on its risk management decisions. In Respondents' proposal, Respondents' proposed remedial action objectives shall specify the contaminants (lead, cadmium, and zinc) and media of concern, potential exposure pathways and receptors, and preliminary remediation goals (acceptable hazardous substance contaminant concentration level or range of levels

for each exposure pathway). In Respondents' proposal, Respondents shall propose preliminary remediation goals that are protective of human health and the environment considering the factors described in 40 CFR §§ 300.430(e)(2)(i)(A) through (G).

47. **Develop Preliminary List of ARARs and To Be Considered Information.** Respondents shall develop a preliminary list of ARARs including, without limitation, State and Quapaw Tribe TBC advisories, criteria or guidance pursuant to 40 CFR § 300.400(g). Respondents shall categorize the ARARs and TBC information as chemical specific, location specific, or action specific. Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review and approval a written list of ARARs and TBCs. The ARARs and TBCs shall be updated as new information is identified by Respondents or EPA.

Development and Screening of Remedial Alternatives

48. Respondents shall develop and screen remedial alternatives for OU4. The purpose of the development and screening of remedial alternatives is to develop a limited number of appropriate remedial alternatives to be evaluated in the detailed analysis of alternatives portion of the Feasibility Study. Once Respondents have developed and screened remedial alternatives for OU4, Respondents shall develop and submit to EPA (with copies to the ODEQ and the Quapaw Tribe) for EPA review and approval, a written **Development and Screening of Remedial Alternatives Report**. The Development and Screening of Remedial Alternatives Report is a submission. In the Development and Screening of Remedial Alternatives Report, Respondents shall describe the results and reasoning employed in screening alternatives, and identify the specific ARARs for each of the alternatives that remain after screening.

In addition to other types of alternatives described in SOW paragraphs 49 through 52, Respondents shall consider, at a minimum, the following remedial alternatives (or some combination thereof) during the RI/FS for OU4:

a. No action (may include monitoring).

b. Surficial source removal by excavation and hauling of mine and mill residues and smelter waste to an off-site landfill for disposal.

c. Surficial source removal and excavation and hauling of mine and mill residues and smelter waste to onsite locations (such as subsidence areas, mine shafts, and/or underground mine workings [e.g., subaqueous disposal]) for disposal. If subaqueous disposal is considered, then Respondents shall evaluate the effects of subaqueous disposal on the ground water, and on acid mine drainage including without limitation the effect of any increased acid mine drainage on water quality down gradient.

d. Beneficial commercial reuse of mine and mill residues and smelter waste for road building (e.g., aggregate in asphalt, road base material [used separately or mixed with an additive such as fly ash, etc.]), in concrete, and encapsulation in polymers for decorative items such as shingles (etc.).

e. Washing the mine and mill residues to remove high metals concentrations and treating the wash water.

f. Restoration of former mine and mill residues and smelter waste locations to beneficial use (agricultural, etc).

g. Capping and vegetating mine and mill residues and smelter wastes in place.

h. Containment and Stabilization of mine and mill residues and smelter wastes.

i. Mine and mill residues and smelter waste treatment.

j. Phytoremediation.

k. Passive Treatment Systems including, without limitation, constructed wetlands which may include engineered and natural wetlands.

l. Institutional Controls.

49. For source control actions, Respondents shall also develop one or more alternatives that involve little or no treatment, but provide protection of human health and the environment primarily by preventing or controlling exposure to hazardous substances, pollutants or contaminants (*i.e.*, lead, cadmium, and zinc), through engineering controls (e.g., containment), and as necessary, institutional controls (e.g., deed restrictions or easements) to protect human health and the environment and to ensure continued effectiveness of the response action. Respondents shall include commercial use of chat as part of the alternative development described in this paragraph.

50. For source control actions, Respondents shall develop a range of alternatives for the remediation of OU4 in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances, pollutants or contaminants (*i.e.*, lead, cadmium, and zinc) is a principal element. If appropriate, as determined by EPA, this range shall include an alternative that removes or destroys hazardous substances, pollutants, or contaminants (*i.e.*, lead, cadmium, and zinc) to the maximum extent feasible as determined by EPA, eliminating or minimizing, to the degree possible as determined by EPA, the need for long term management.

51. For source control actions, Respondents shall also develop other alternatives which, at a minimum, treat the principal threats posed by OU4 but which vary the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed.

52. Respondents shall develop one or more innovative treatment technologies for further consideration if as determined by EPA those treatment technologies offer the potential for comparable or superior performance or implementability; fewer or lesser adverse impacts than other available approaches; or lower costs for similar levels of performance than demonstrated treatment technologies.

53. **Screening of alternatives**. Respondents shall use the criteria in 40 CFR §§ 300.430(e)(7)(i) through (iii) to guide Respondents in the screening of alternatives.

Detailed Analysis of Alternatives.

54. Respondents shall develop and submit, for EPA (with copies to the ODEQ and the Quapaw Tribe) review and approval, a written document which is a **FS Report** which provides a detailed analysis which Respondents shall conduct on the limited number of alternatives that passed the screening stage as determined by EPA. The FS Report is a submission. In the FS Report analysis, Respondents shall identify pertinent advisories, criteria, or guidance documents. In the analysis, Respondents shall provide an assessment of the individual alternatives against each of the seven evaluation criteria described in 40 CFR §§ 300.430(e)(9)(iii)(A) through (G). In the analysis, Respondents shall provide a comparative analysis that focuses upon the relative performance of each alternative against each of the seven evaluation criteria described in 40 CFR §§ 300.430(e)(9)(iii)(A) through (G). Respondents shall ensure that the analysis reflects the scope and complexity of OU4 problems and alternatives being evaluated, and that the analysis considers the relative significance of the factors within each of the criteria described in 40 CFR §§ 300.430(e)(9)(iii)(A) through (G). In developing the FS Report, Respondents shall follow the FS Report format described in Table 6-5 of the RI/FS Guidance. Respondents' FS Report shall include text which covers all the topics listed in Table 6-5.

Schedule.

55. The following schedule identifies major submittals needed for completing the work identified in this SOW. Submittals identified in the "**Action**" and "**Timing**" columns, unless noted otherwise, shall be prepared by the Respondents.

ACTION	TIMING
1. Effective Date – Administrative Order On Consent (Order)	Initiation of the RI/FS Process
2. Submit Project Coordinator to EPA	Within 5 days of Effective Date of the Order
3. Identify Contractor to EPA	Within 5 days of Commencement of Work
4. Identify Quality Assurance Official	Within 5 days of Effective Date of the Order
5. Provide Proof of Insurance to EPA	Within 30 days of Effective Date of the Order
6. EPA provides Preliminary Remedial Action Objectives	Within 30 days of Effective Date of the Order
7. Submit Draft Scoping Phase Work Plan to EPA	Within 45 days of Effective Date of the Order
8. Meeting on Draft Scoping Phase Work Plan	Within 14 days of receipt of notice of meeting from EPA
9. Submit Final Scoping Phase Work Plan to EPA	Within 30 days of meeting on Draft Scoping Phase Work Plan
10. Submit Draft Data Gap Analysis Report	Within 120 days of approval of Final Scoping Phase Work Plan
11. Submit Conceptual OU4 Model	Within 120 days of approval of Final Scoping Phase Work Plan
12. Meeting with EPA on Draft Data Gap Report and Conceptual OU4 Model	Within 14 days of receipt of notice of meeting from EPA
13. Submit Final Data Gap Analysis Report	Within 30 days of the meeting on the Draft Data Gap Analysis Report
14. Submit Draft RI/FS Work Plan to EPA	Within 60 days of the meeting on Data Gap Analysis Report
15. Meeting with EPA on the Draft RI/FS Work Plan	Within 14 days of receipt of notice of meeting from EPA

ACTION	TIMING
16. Submit Final RI/FS Work Plan to EPA	Within 30 days of meeting on Draft RI/FS Work Plan
17. Submit Draft Sampling and Analysis Plan (SAP) – to include Field Sampling Plan, Quality Assurance Project Plan, and Health and Safety Plan to EPA	Within 45 days of EPA Approval of the Final RI/FS Work Plan
18. Meeting with EPA on the Draft SAP	Within 14 days of receipt of notice of meeting from EPA
19. Submit Final SAP to EPA	Within 30 days of meeting on Draft SAP
20. Submit Draft Data Security Plan to EPA	Within 30 days of EPA Approval of the Final RI/FS Work Plan
21. Submit Final Data Security Plan to EPA	Within 30 days of receipt of EPA's comments on Draft Data Security Plan
22. Commence Field Studies	Within 45 days of Approval of Final SAP, QAPP, and H&SP
23. Notice of Field Activities	15 days prior to initiation of field activities and 10 days prior to completion of field activities
24. Access Acquisition to Field Sites	Within 30 days of identifying need to access field sites
25. Submit Draft Preliminary Site Characterization Summary to EPA	Within 90 days of receipt of the final laboratory sample results from field investigations
26. Meeting with EPA on the Draft Preliminary Site Characterization Summary	Within 14 days of receipt of notice of meeting from EPA
27. Submit Final Preliminary Site Characterization Summary to EPA	Within 30 days of meeting on Draft Preliminary Site Characterization Summary
28. EPA provides the HHRA, ERA and memorandum on its risk management decision	Within 60 days of receipt of Final Preliminary Site Characterization Summary
29. Submit Draft Proposal of Preliminary Remedial Action Objectives (RAOs)	Within 30 days of receipt of EPA's HHRA and ERA memoranda on its risk management decisions
30. Submit Draft Candidate Technologies Report to EPA	Within 60 days of approval of the Final Preliminary Site Characterization Summary
31. Meeting with EPA on RAOs and Draft Candidate Technologies Report	Within 14 days of receipt of notice of meeting from EPA
32. Submit Final Proposal of RAOs	Within 30 days of meeting on the RAOs
33. Submit Final Candidate Technologies Report	Within 30 days of meeting on Draft Candidate Technologies Report
34. Submit Draft Remedial Investigation (RI) Report	Within 90 days of EPA approval of Final Preliminary Site Characterization Summary, or 30 days after receipt of Human Health and Ecological Risk Assessments, whichever is greater
35. Meeting with EPA on the Draft RI Report	Within 14 days of receipt of notice of meeting from EPA
36. Submit Final Remedial Investigation (RI) Report	Within 60 days of the meeting on the Draft RI Report
37. EPA determines need for Treatability Study or Studies	Within 30 days of EPA approval of the Final Candidate Technologies Report

ACTION	TIMING
38. If Treatability Studies required by EPA, Submit a Draft Treatability Study Work Plan to include Sampling and Analysis Plan, QAPP for Treatability Study, and Health and Safety Plan for Treatability Study if necessary.	Within 60 days of receipt of statement of need to conduct treatability study from EPA
39 Meeting with EPA on the Draft Treatability Study Work Plan	Within 14 days of receipt of notice of meeting from EPA
40. Submit Final Treatability Study Work Plan	Within 30 days of meeting on Draft Treatability Work Plan
41. Initiate Treatability Studies	Within 30 days of receipt of approval of Final Treatability Study Work Plan
42. Submit Draft Treatability Study Report	Within 45 days of receipt of final results of treatability studies
43. Meeting with EPA on the Draft Treatability Study Report	Within 14 days of receipt of notice of meeting from EPA
44. Submit Final Treatability Study Report to EPA	Within 30 days of meeting on Draft Treatability Study Report
45. Submit Draft Development and Screening of Remedial Alternatives Report to EPA	Within 60 days of receipt of approval of Candidate Technology by EPA, or within 45 days of approval of the Final Treatability Study Report, if required
46. Meeting with EPA on the Draft Development and Screening of Remedial Alternatives Report	Within 14 days of receipt of notice of meeting from EPA
47. Submit Final Development and Screening of Remedial Alternatives Report to EPA	Within 30 days of the meeting on the Draft Development and Screening of Remedial Alternatives Report
48. Submit Draft Detailed and Comparative Analysis of Alternatives to EPA	Within 60 days of receipt of approval of Development and Screening of Remedial Alternatives Report by EPA
49. Meeting with EPA on the Draft Detailed and Comparative Analysis of Alternatives	Within 14 days of receipt of notice of meeting from EPA
50. Submit Final Detailed and Comparative Analysis of Alternatives to EPA	Within 30 days of meeting on the Draft Detailed and Comparative Analysis of Alternatives
51. Submit Draft Feasibility Study Report	Within 60 days of receipt of approval of Final Detailed and Comparative Analysis of Alternatives by EPA
52. Meeting with EPA on Draft Feasibility Report	Within 14 days of receipt of notice of meeting from EPA
53. Submit Final Feasibility Study Report	Within 45 days of meeting on Draft Feasibility Report
54. Submit Monthly Progress Reports	Within 20 days of the last day of each month
55. Submit Laboratory Protocols	Within 10 days prior to beginning any analyses

ATTACHMENT A

REFERENCES
POTENTIALLY RESPONSIBLE PARTIES
STATEMENT OF WORK
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
OPERABLE UNIT 4
TAR CREEK SUPERFUND SITE; OTTAWA COUNTY, OKLAHOMA

The following list, although not comprehensive, comprises many of the regulations and guidance documents for the RI/FS:

The (revised) National Contingency Plan, 40 CFR Part 300.

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01.

Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies, U.S. EPA, Office of Waste Programs Enforcement, Appendix A to OSWER Directive No. 9355.3-01.

Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies, U.S. EPA, Office of Waste Programs Enforcement, OSWER Directive No. 9835.3.

A Compendium of Superfund Field Operations Methods, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

EPA NEIC Policies and Procedures Manual, May 1978, revised November 1984, EPA-330/9-78-001-R.

Data Quality Objectives for Remedial Response Activities, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, U.S. EPA, Quality Assurance Management Staff, Washington, DC, EPA QA/R-5, Draft Final, July 1993.

Users Guide to the EPA Contract Laboratory Program, U.S. EPA, Sample Management Office, August 1982.
Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements, U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

CERCLA Compliance with Other Laws Manual, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1-01 and -02.

Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

Guidance on Preparing Superfund Decision Documents, U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.3-02.

Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part A), December 1989, EPA/540/1-89/002.

Human Health Evaluation Manual, Part B: Development of Risk-based Preliminary Remediation Goals, U.S. EPA, Office of Emergency and Remedial Response, December 13, 1991, OSWER Directive No. 9285.7-01B.

Human Health Evaluation Manual, Part C: Risk Evaluation of Remedial Alternatives, U.S. EPA, Office of Emergency and Remedial Response, December 13, 1991, OSWER Directive 9285.7-01C.

Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments; Office of Emergency and Remedial Response; EPA/540-R-97-006; June 5, 1997.

Risk Assessment Guidance for Superfund, Volume 1 - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments); Interim; Office of Solid Waste and Emergency Response; January 1998; EPA/540-R-97-033.

Final Guidance for Data Usability in Risk Assessment (Parts A&B), June 1992, OSWER Directive No. 9285.7-09A.

Guidance for Data Useability in Risk Assessment, October, 1990, EPA/540/G-90/008.

Performance of Risk Assessments in Remedial Investigation/Feasibility Studies Conducted by Potentially Responsible Parties, August 28, 1990, OSWER Directive No. 9835.15.

Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions, April 22, 1991, OSWER Directive No. 9355.0-30.

Superfund Exposure Assessment Manual, April 1988, OSWER Directive No. 9285.5-1.

Health and Safety Requirements of Employees Employed in Field Activities, U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

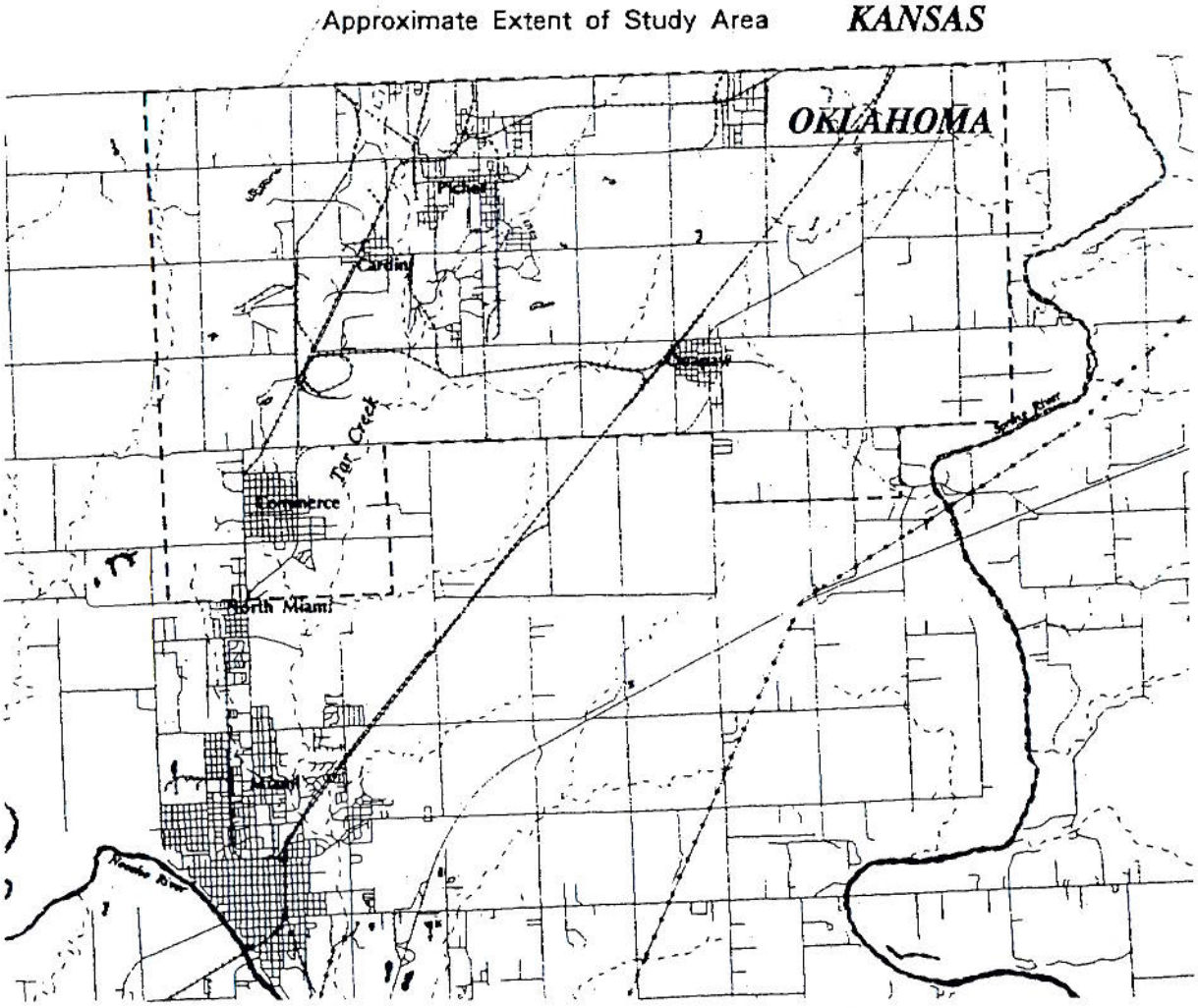
OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

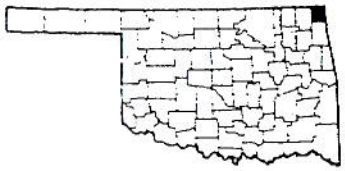
Interim Guidance on Administrative Records for Selection of CERCLA Response Actions, U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

Community Relations in Superfund: A Handbook, U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0#3B.

Community Relations During Enforcement Activities And Development of the Administrative Record, U.S. EPA, Office of Programs Enforcement, November 1988, OSWER Directive No.9836.0-1A.

ATTACHMENT 2 - MAP OF TAR CREEK SUPERFUND SITE





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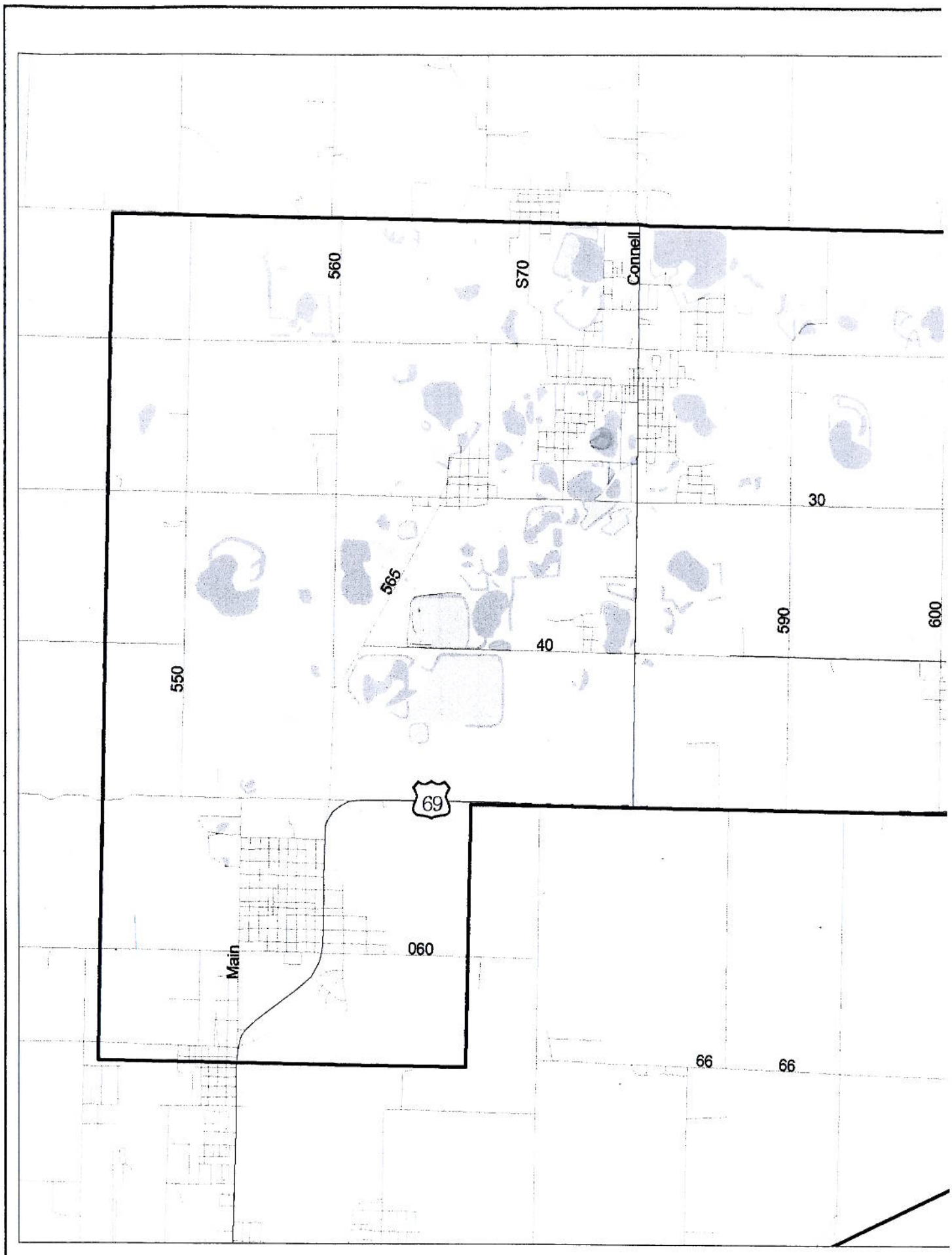
0.75 0.25 MILES

FIGURE 1

ecology and environment
International Specialist in the Environment
Dallas, Texas

TAR CREEK SUPERFUND SITE

TDD: T06-9510-801	Ottawa County, Oklahoma
PAN: EDK0429SEA	Site Vicinity Map


560
S70
Connell
30
565
590
600
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550
69
Main
060
66
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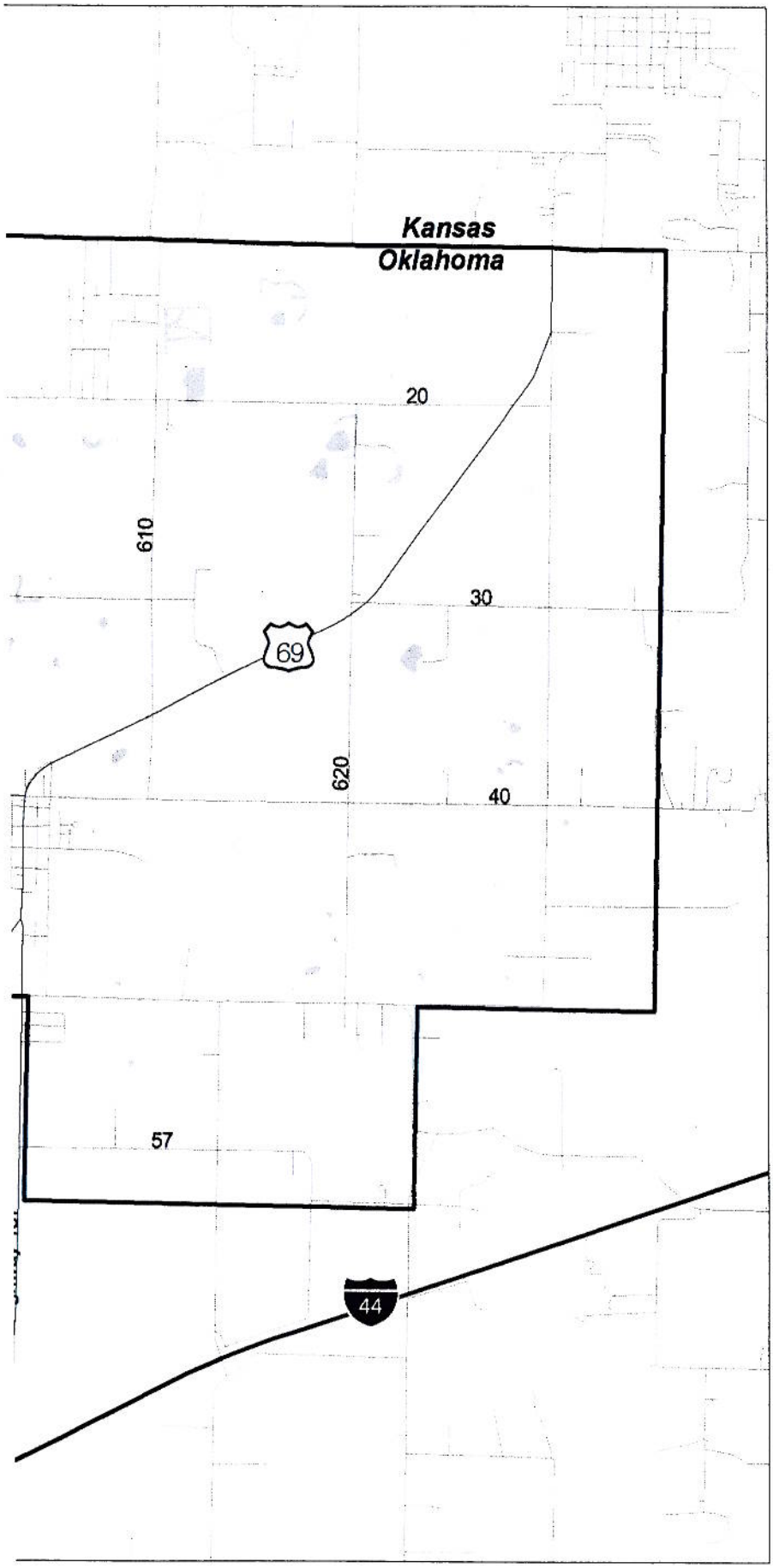
Attachment 3
Map of Operable Unit #4, Tar Creek Superfund Site, Ottawa County, Oklahoma



Tar Creek Operable Unit # 4
Interstate
Major Road
Road
Chat Pile
Tailings Pond

Sources:
Tar Creek Boundary- EPA
Tailings- Oklahoma Geologic Survey, Kenneth V. Luza, Donald A. Preston, 1983
Map Features- Census Bureau 2000 Tiger Line Files

N

Note: No claims are made to the accuracy of the data or its suitablity for a particular use.

0 0.7 1.4 2.1 Miles

EPA Region 6
GIS Support Team
Dallas, Texas
20030709JB01